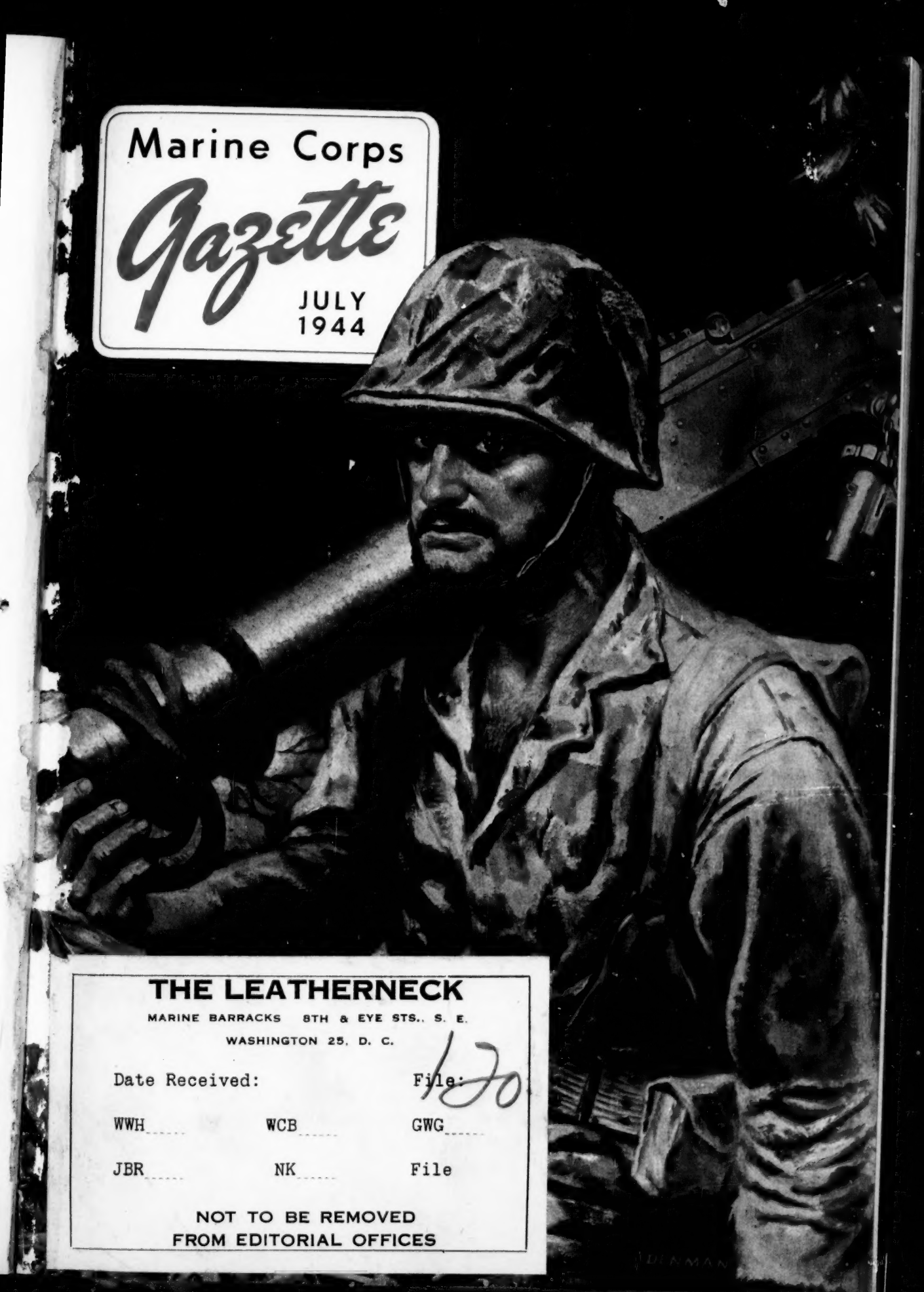
Marine Corps Gazette

JULY 1944



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The Editors of The Marine Corps Gazette

announce a

$500.00 PRIZE ARTICLE CONTEST

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Any Marine is eligible. Material submitted must be of a military-technical nature, and should have vital, current interest for a large proportion of GAZETTE readers. Fiction is not acceptable. Articles involving personal experience are acceptable, but must be primarily concerned with technical and factual subjects.

Any story submitted which needs diagrammatical illustrations should be accompanied by roughs of the necessary drawings. These in turn will be redrawn by staff artists, if necessary. The length of the manuscripts should be between 3,000 and 5,000 words. Only one prize will be awarded. The prize will be $500.

CONTEST FACTS

1. All manuscripts must be cleared by authors through their local Security Officer and must carry the clearance stamp of the Local Security Officer before being submitted. Those not carrying this stamp will be rejected. Contributions from Marines stationed overseas that are not approved for security reasons will be automatically disqualified.

2. The prize-winning article and other manuscripts accepted for publication will be cleared by THE MARINE CORPS GAZETTE through the Division of Public Relations, Headquarters, U. S.. Marine Corps.

3. The editors reserve the right to publish not only the $500 prize article but also other worthy manuscripts in part or in their entirety. If a non-prize winning article is published, the author will receive the regular space rate prevailing. Manuscripts not used will be returned upon request. Authors may not submit copies of their manuscripts to other publishers until the original has been used or returned.

4. The contest closes October 15, 1944. Entries must be postmarked not later than midnight of that date.

5. The $500 prize-winning article will be published in the January, 1945, issue of THE MARINE CORPS GAZETTE.

6. The decision of the judges will be final. In case of a tie, duplicate prizes will be awarded.

7. All material submitted is mailed at the author's risk. It is advisable that contributions be wrapped carefully and, when possible, mailed First-Class.

8. Papers should be typewritten and double spaced. If this is not practicable, legible handwriting will be accepted and no demerit given the author on this account.

9. Staff members of either THE LEATHERNECK Magazine or THE MARINE CORPS GAZETTE are not eligible to participate.

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FOR UNITED STATES MARINES

Gazette

JULY 1944

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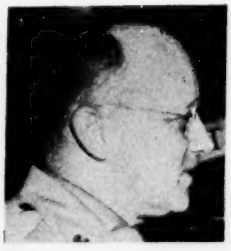
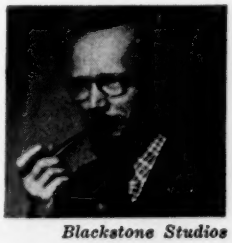
THIS MONTH'S CONTRIBUTORS



BRIG. GEN. LEONARD E. REA, USMC, Executive officer of the Quartermaster Department, author of "Supply Pipe Line," enlisted in the Marine Corps in 1917, and has seen duty in France, Germany, Nicaragua, China, Guantanamo Bay, aboard the USS *New Mexico,* and in the South Pacific. Among other decorations, he has been awarded the Navy Cross for remaining in action with his platoon near Blanc Mont, France, in 1918 after being severely wounded.

U. S. Army Photo

BRIG. GEN. ALDEN H. WAITT, USA, began his military career in 1917 in the Gas Defense Service, and in the following year became Chief Gas Officer of the 29th Division. He has never been far away from the study of chemical weapons, and holds firm to the conviction that chemical agents are too valuable in warfare to be abandoned. He is author of numerous magazine articles and of the book *Gas Warfare,* first published in 1942. A completely revised edition appeared in the bookstores in May of this year.



Blackstone Studios

MR. FLETCHER PRATT, who this month contributes "The War at Sea—Admiral King's Report," has been an author and journalist since 1920. Among his many published works, those of particular interest to Marines include *The Navy—A History* (1938), *Sea Power and Today's War* (1939), *America and Total War* (1941), and *The Navy's War* (1944) "a graphic account of the great battles in which the United States Navy turned from defense to attack in this war." To many people Mr. Pratt is best known as the inventor of the ingenious Naval War Game. He is a member of the U. S. Naval Institute.

★ ★ ★

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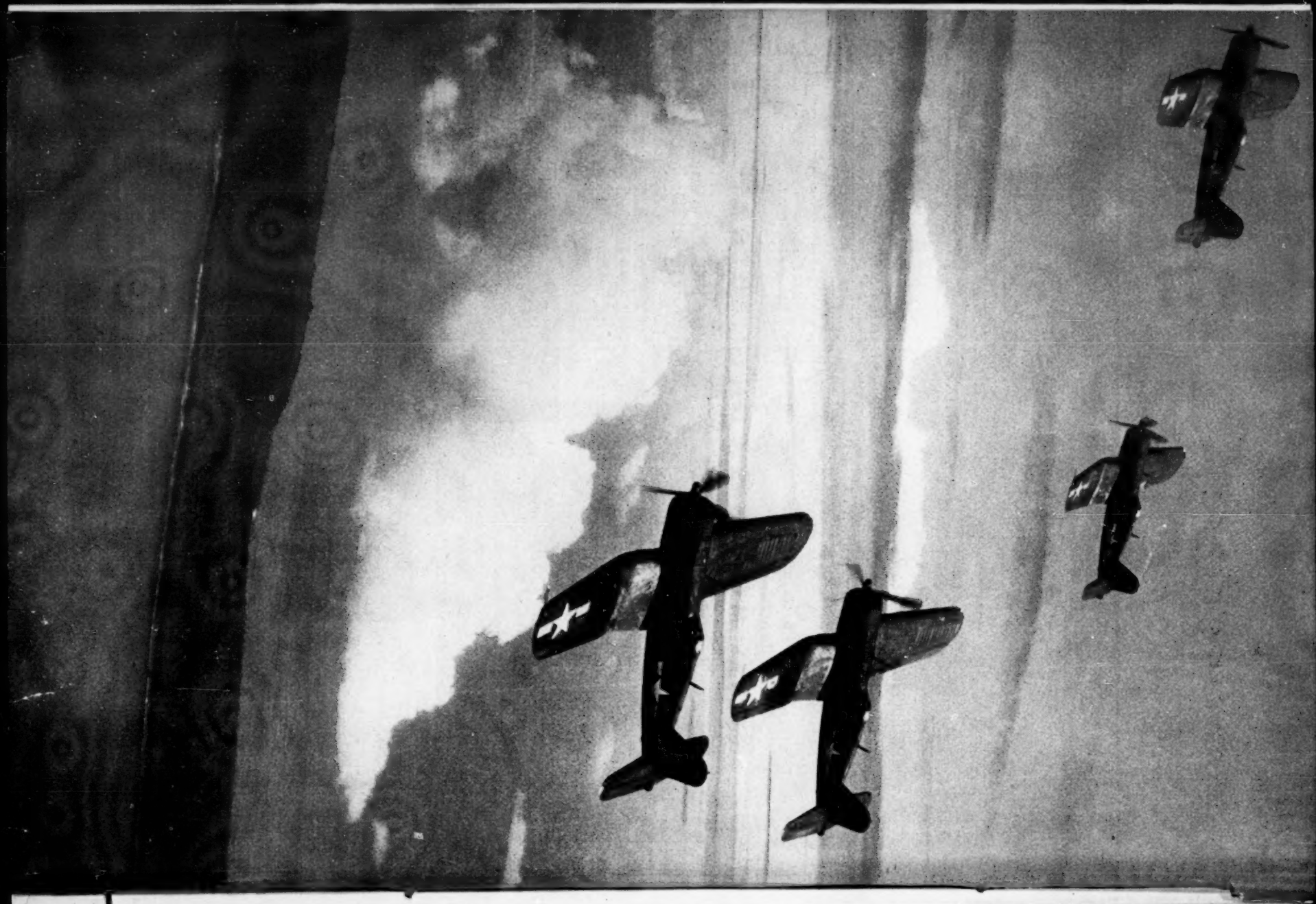


The War at Sea - Admiral King's Report

A leading student of naval affairs ascribes our mounting success over the Japanese at sea to the superiority of our morale as well as the preponderance of our strength. The Japs, he says, have admitted it by their actions. *By Fletcher Pratt*

ADMIRAL ERNEST KING has made his first comprehensive and coordinated report to the nation on the war at sea. It covers the operations down to March 1, 1944, and there is no easily apparent reason for this dating. March 1 does not mark the wrapping up of one of those packages of time by which we like to regulate our affairs; there was no great battle to climax a period.

To understand why the report should be issued at this point, it is necessary to refer to the text. Even there one finds only that it would be approximately the date when the battleship-carrier force that raided Saipan, Tinian, and Guam would be returning to harbor. The raid was an interesting achievement but in a war on such a scale it was a detail. It is necessary to refer to the report as a whole, to read between the lines the things Admiral King did not say, if one wishes to discover why it is appropriate to tell the story at this time.

It marks the date at which the Japanese confessed they had lost the sea war, abandoned all initiative into our hands, and prepared to make their defense by land. They may attempt to recover their initiative on the water. It is always dangerous to say that an enemy is licked until he actually hauls down his flag, but the fact that we are going into the sixth inning with an eight-run lead and good pitching stands out clearly enough from the words of the report itself. "A task force en route to deliver attacks in the Marianas was detected by enemy search planes and subsequently attacked by enemy bombers and torpedo planes. The task force suffered no damage, shot down a number of planes and proceeded to deliver attacks on the objectives the next day."

To Flee Is to Lose

This was the last act. The Marianas lie far north of Truk; they are the very seat of the Japanese power and empire. It is as though our enemies had launched a similar assault against Vancouver Island. The Japs did not react save with their local defenses. They fled with those fleets that had swept so irresistibly through the Indies and had come rushing up to attack Dutch Harbor and Midway. It was no doubt the rational thing to do, and the physical courage of our adversaries is unquestionable; but by that flight, by that failure to challenge, even against odds, they placed themselves in exactly the position occupied by the French Navy during the eighteenth century wars with England or the Russian Navy in its own war with Japan.

The Admirals of the defeated fleets in those instances always had some good, rational reason for conserving their ships against a greater emergency; for using them to some other purpose than fighting for a command of the sea. Inevitably the time came when they were forced to fight; invariably they lost. The history of war is full of instances in which a weaker force has triumphed against odds; there are two in this report. We know them as the battles of Coral Sea and Midway. But history contains not one instance of a naval force that consistently avoided battle being able to win in the end, even though it succeeded in building its own strength up to the point of numerical superiority. The morale factor sets in. However devoted the seamen, they are never quite able to get away from the idea of pulling out to fight under more favorable conditions. They no longer think of winning today's battle today.

Japanese Morale Bankrupted

This, then, is the main point of the report—that the Japanese have admitted our superior morale. It is not just because they ran away from the forces that raided Truk and the Marianas, or that they made no effort to eject us from Kwajalein and Eniwetok as they had at strategically less important Guadalcanal. The bankruptcy of Japanese morale stands out all over the report and in half a dozen places. One of the most striking features of the sea war as a whole is the sharp change in Japanese tactics from gunnery action and bombing by day to torpedo attacks and fighting by night. Now the torpedo is a formidable weapon, in the technical use of which the Japanese have probably so far excelled our own Navy. But when used, as here, not to support and complete the work of gun and bomb but as a substitute for them, it is the weapon of a self-confessed weaker party, the weapon of retreat. Moreover it usually fails against alert opposition.

The battle of Tassaforonga (November 30,

← **"Our fliers deserve any compliment that can be given." Marine Corsairs over the Pacific.**

1942) furnishes a good example, because it is usually rated as an American defeat. We had four heavy cruisers torpedoed and one of them went down, extremely heavy cost to pay for getting rid of light craft and transports which, according to the communique of the date, were 14 in number. The report does not attempt to deny that our losses were severe, but: "The effect of this engagement was to break up a Japanese reinforcing attempt" and "it soon became evident that the enemy was evacuating what little strength he had left on the island" of Guadalcanal. The action was unsatisfactory to our side; but to the enemy it was so much less satisfactory that they abandoned the campaign.

The Higher Echelons in Error

No campaigns were abandoned by our forces at any stage. The nearest case was Java Sea, which can hardly be described as an abandonment, for the Allied fleet there had been practically wiped out. The contrast points to a certain lack of moral stamina on the part of the Japanese, which will be a surprise and seem an overstatement to those who know them as some of the most deadly and persistent fighters in the world, never giving up until they are killed. But battlefield behavior is a matter of physical courage, which no one has denied them. We are discussing something else—an intellectual and emotional matter, particularly affecting the higher echelons of command. It must already have been evident to those Japanese higher echelons at the time of the later battles for Guadalcanal that they had made a pair of monstrous miscalculations.

The nature of one of their errors is very clear. The Japanese believed what someone had told them about the inherent superiority of land-based aircraft to those that can be carried on shipboard. Admiral King avoids such generalities, but it is evident from his accounts of Pearl Harbor, of the fighting in the Solomons, of the subsequent raids on Japanese positions, that their strategy for the war was based on this concept.

Their carriers throughout were treated as auxiliaries and even as expendables (as at Pearl Harbor and Midway.) The essential thing from their point of view was to gain possession of islands throughout the western Pacific and to set up air strips on them. Plans from these strips would form both a scouting and a defensive network throughout the whole system, assembling rapidly because of their enormous mobility at any point threatened with attack, and assembling with such force, from so many sources, as to render attack futile. Every station in that network was within easy airplane range of at least two others and often of more. The attempt of the *Repulse* and the *Prince of Wales* to thrust into the South China Sea represents the Japanese system in perfect operation. It is the system of what Mussolini called the unsinkable aircraft carrier. The unsinkable carriers in this case had only very lately been acquired but they were sufficient to finish the two British ships.

Nature of Sub and Carrier

One mistake in this strategy lay in overlooking or underestimating the American submarines. The Japanese were certainly aware that the whole complex of islands could be maintained only by a constant flow of supplies carried in ships, and they counted on their land-based air cover to protect the ships from surface attack. This worked admirably during the Java Sea campaign. A study of the King report shows five separate thrusts by the Allies against the Japanese moving down into the Indies. Of these only one—the raid of Talbot's four American destroyers into Makassar Strait—got home; all the others were repelled by Japanese aviation with heavy damage to the raiders.

But no similar preparation was made for deal-

A million tons of U. S. Naval might anchored in waters held by the Japanese only a week earlier. The picture reveals nine carriers, a dozen battleships, and scores of smaller craft.

ing with our submarine service. This is not surprising. The service was—up to the outbreak of the war—neither very large nor, in the minds of most strategists, very important. As a result of the oversight, of the unexpected excellence of the service, our submarines have been demonstrating to the Germans how a U-boat war should really be waged. Admiral King is able to say, "No branch of the naval service has acquitted itself more creditably," and that "Japanese capacity to maintain the war at sea and in her advanced areas has suffered increasingly, due to the loss of vital shipping."

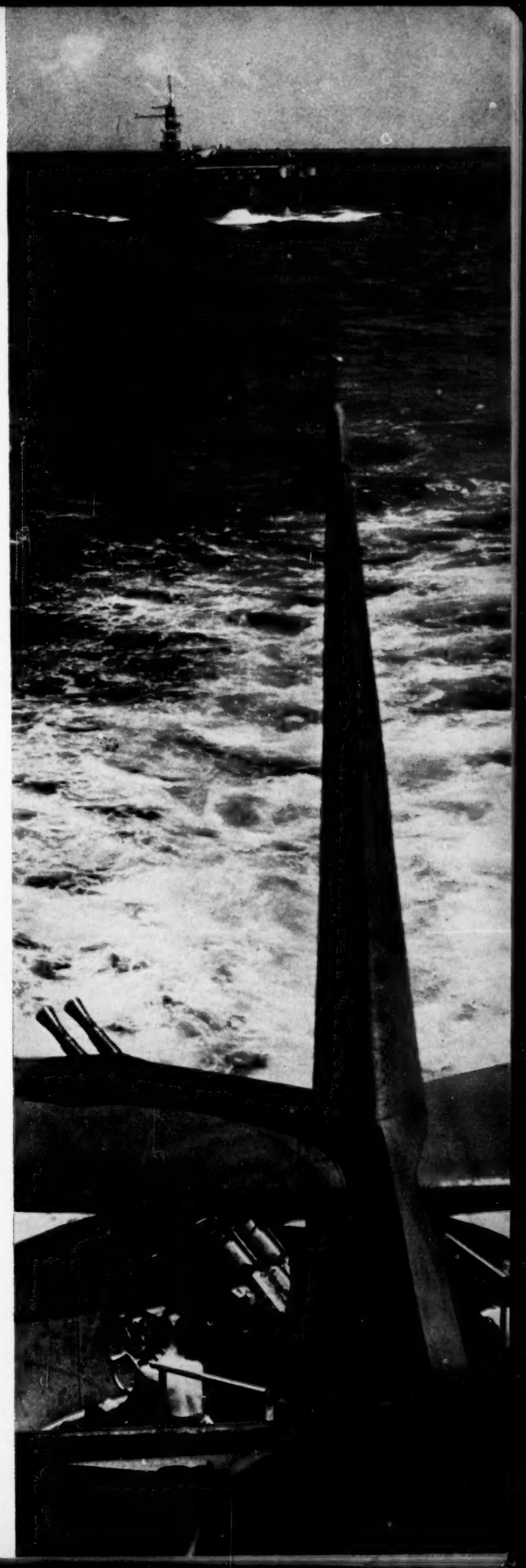
This was not, however, the major error. It can be maintained on the basis of this report that the Japanese might have gotten our submarines in hand, as we have succeeded in reducing the German submarines "from menace to problem," if they had not been at the same time so hard hit from another direction. They miscalculated the true nature of an aircraft carrier. They forgot that it is only a deck or a field, a base from which planes take off, and that its capacity is limited, whether the carrier be sinkable or unsinkable. The point was bloodily demonstrated for them in the first attack on the Solomons, the landing in August, 1942. So much American air strength accompanied the expedition that it was effectively a contest of three large carriers against one small, 12 squadrons against one, and that one caught so unready, by reason of the swift undetected approach of our fleet, that it was wiped out with no loss to us.

The Japs Caught Napping

The essential facts of that operation were concealed by the presence of the surface ships with their gunnery support, by the confusing circumstance of the Battle of Savo Island, and by the obscure fighting on land, all matters which almost irresistibly draw attention. But those essential facts are that the air attack from the floating bases of the carriers moved in so rapidly that the blow arrived before the threat of it and therefore an important outpost was left to meet the emergency with its local air resources. Those resources proved wholly inadequate. By the time the immediate supporting fields of the Japanese network sent their planes in, the field on Guadalcanal was already in the hands of the U. S. Marines. After this the Japs were presented with the problem, not of defense but of reconquest, a very different matter.

The Japanese possessed a local initiative and they did stage planes in to the fields ranging on Guadalcanal as their system provided. But the fact that the Japs' attacks were so violent as to make the defense against them one of the brighter pages in Marine history; the fact that

"The point of the carrier was bloodily demonstrated for the Japs in the Solomons." ➡



Fighters and bombers are in the air, and dive bombers are about to take off. The scene is aboard a first line carrier bound for the raid on Marcus Island, September, 1943.

their training and equipment made the fliers of Henderson Field individually far superior to their opponents; the fact that through the early months we never had many planes there and sometimes could not use the field at all—all this should not be allowed to obscure the real nature of the case. The unsinkable carriers of the Japanese supporting fields could never supply enough planes at any one time, could never keep them over Henderson Field long enough to achieve what our forces had achieved on that first day. They were aware of this. The great battles of the Eastern Solomons and Santa Cruz were produced by nothing but attempts to do what we had done—to move in against a single fixed carrier of an island so many floating carriers that the former would be overwhelmed.

Losses in those battles are of little absolute or relative importance beside the fact that the Jap air strength over the island never could be brought up to a figure sufficient for the accomplishment of their mission. On each occasion we also moved in sea-air strength to support the field.

Jap Intelligence Weak

Parenthetically, Japanese scouting or intelligence, or both, do not seem to have been very good. Our blow at Guadalcanal fell as a surprise, while theirs were met on the way in. But this may merely have been because they had an erroneous concept at the base of their whole structure, the idea that island bases should be able to maintain themselves without floating help. The arrangements for long-range scouting in which our Navy has specialized do not seem to have been regarded by the enemy as necessary.

It would seem that Japanese moral disintegration set in at about the close of the Guadalcanal fighting and first appeared in the form of a tacit admission of the individual superiority of American planes and fliers. Here is the report: "The Japanese had had time to repair and reorganize their surface forces and to replace their carrier air groups, and therefore when there were heavy increases in shipping at Buin and Rabaul late in January (1943), and a stepping up of air activities, it appeared that they were ready to move. Ships available to Admiral Halsey to prevent such a move now included three new battleships, four old battleships, two carriers, three auxiliary carriers . . ."

Nothing happened because the Japs did not try to make anything happen. Now we do not know what their battleship strength was and for the purpose of the present inquiry it does not matter, since in modern naval war you can have a complete carrier-plane battle without calling the battleships in. The point was that the Japanese fleet with its reconstituted carrier groups was unwilling to try conclusions in an aerial engagement with two regular and three escort carriers. The report does not say how many carriers they had at the time but they could hardly have put fewer squadrons into the air than our ships and it was in their power to bring into play in addition the land-based planes of Buin, Munda, Kahili, with seaplanes from the Choiseul anchorages. Why didn't they try it?

Through repeated disproportionate losses in the air fighting they had simply become convinced that our fliers had a qualitative superiority so great that it could be overcome only by surprise or a pronounced numerical superiority on their side. This is the only possible conclusion. It is not a special compliment to the fliers who operated from Henderson Field, though they deserve any kind of compliment that can be given. It would seem rather to represent a decline in the quality of the Japanese fliers themselves. Their men at Coral Sea and Midway were

equal to our best but there is evidence that these were a relatively small group of highly trained long-service men. By Guadalcanal time they were mostly dead and the Jap second team were not their equals nor our's. Captain Marion Carl has remarked that he would have grounded a pilot of his squadron who made his turns as roughly as some of the Japanese he encountered in the last days of Guadalcanal.

The nature and significance of the Japanese error about aviation is made still more clear when we come down to Tarawa, or better, Kwajalein-Eniwetok, since at Tarawa the desperate nature of the ground fighting concealed the true strategic character of the case, as it was concealed by a series of antecedent circumstances at Guadalcanal. In both cases the point which received our attack was not an outpost but one well within the network of Japanese air bases. In both it was approached by so huge a force of carriers that not only were the local air defenses dominated as on Guadalcanal but all supporting air fields as well. A whole section of the network was ripped apart. In sea-air war this represented the American reply to the doctrine of the unsinkable island-carrier, and the reply amounts to this: "Yes, an airfield is unsinkable, but a carrier is a mobile airfield and we can now move 30 or 40 airfields in to attack two or three."

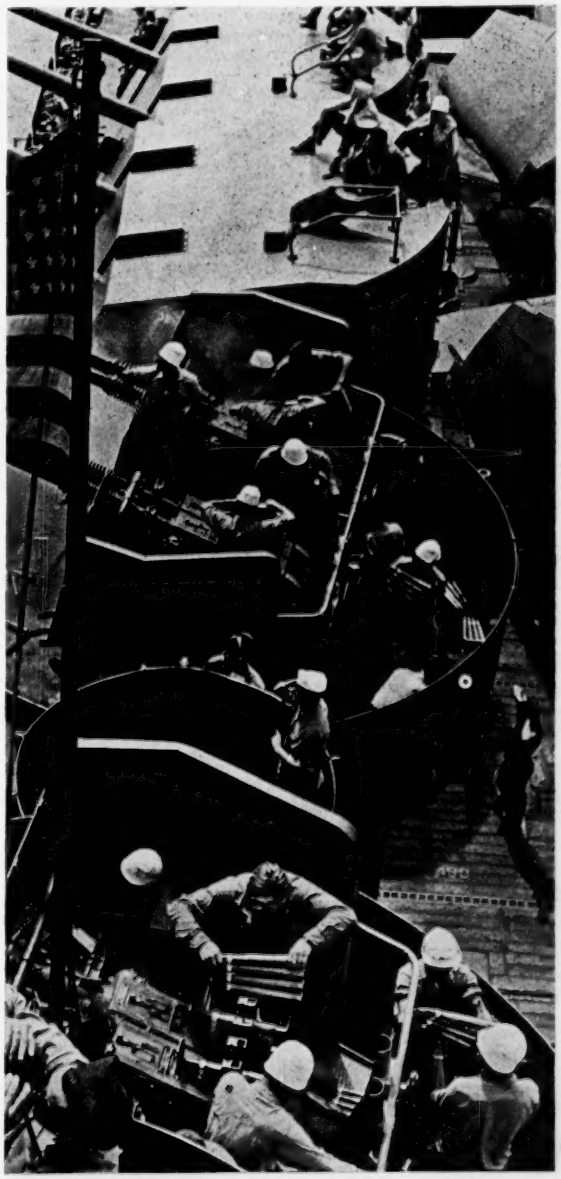
Strategic Phases in the Pacific

It is interesting to note that this reply not only laid bare the Japanese error, not only produced that decay in Japanese command morale which became so evident with the raid into the Marianas, but also changed the whole character of the war. This is the first time that an accurate account of the whole progress of events has been brought together in a single place. Admiral King divides the Pacific war into strategic phases, very properly for his purpose—the pure defensive, down to about the Battle of Coral Sea; the defensive-offensive, reaching from that point to the landings in the Solomons; the offensive-defensive, "during which we still had to use a large part of our forces to defend our recent gains;" and the pure offensive stage in which we still find ourselves. But quite another classification is possible with different dividing lines, an arrangement according to the character of the operations.

During Admiral King's defensive phase all the combats were on the fringes of their advance, consisting mainly of delaying actions with gun and torpedo by sea and a hopeless static defensive by land. This was succeeded by the phase of the great long-range carrier battles in which the ships never sighted each other—a period which runs from Coral Sea down to the bloody combat of Santa Cruz in October, 1942 and which closes with remarkable abruptness at that point. (One of the most interesting features of the war, both tactically and in its revelation of the enemy's ideas, is that not a single Japanese carrier has been reported in action since Santa Cruz.)

Surface and Amphibious Operations

Overlapping this is a series of surface actions, mainly by night, gunnery affairs in which the Japanese show an increasing tendency to rely on the torpedo, as mentioned above. They are brief (the longest, that of November 12, lasted 24 minutes), fought at hot speed, and are distinguished by the enormous amount of damage inflicted in so limited a time. The last was in November, 1943 off the southern coast of New Ire-

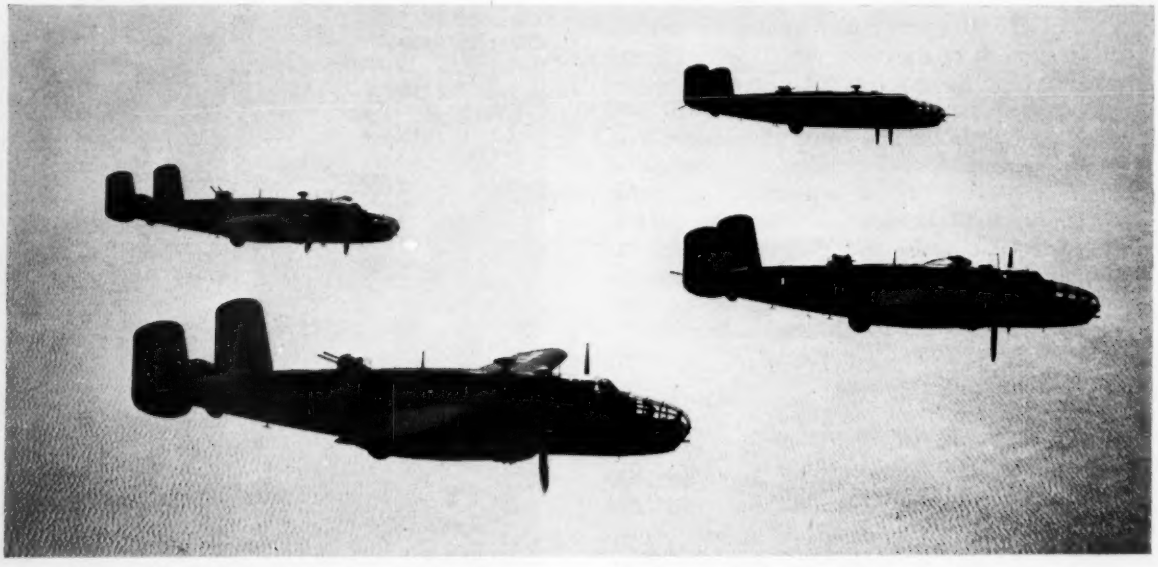


Navy gunners blast away with 40 mm. weapons during drill aboard an aircraft carrier.

land and resulted not from any enterprise on the part of the enemy (he had abandoned enterprise by this time) but because he was caught where he had to fight.

Overlapping this phase again, beginning with the landing at Guadalcanal-Tulagi, is a period of amphibious operations. This is one of the most striking features of the war and certainly the one which has introduced the widest changes into all naval technique. The carrier combats are not an exception; they merely represent the old fashioned gunnery action for command of the sea pushed out to the increased ranges of the airplane.

Amphibious operations: even the phrase itself is new. There are few examples of them in history and those are mostly failures. There was Gallipoli and several projects for landing behind the German lines in Belgium during the last war.



Sinister silhouettes for the Japanese. These PBJ's, new Marine Corps bombers now in increasing action in the Pacific, are destined to blast Japs from island to island.

Learning Amphibious Operations

The American Civil War provided one successful example at Fort Fisher, but against that can be set the earlier defeat before the same place; the failure of Foote's gunboats and Sherman's army at Vicksburg and the unsuccessful attack on Charleston by Admiral Dahlgren in 1863. The attacks on Hilton Head, Fernandina and Hatteras Inlet were not amphibious operations; naval gunfire so dominated the defense at all these places that the troops had nothing to do but accept their surrender. The Crimean war provided one moderately successful operation of the kind. Back before that there are records of no less than eight attempts to land on the coasts of France or Spain during the Napoleonic Wars, some of them in great force. All ended in bloody repulse.

And so on; there were no precedents except the general precedent that the thing could not be done. As to amphibious war, everything had to be discovered, everything learned. Admiral King describes it as "a method of warfare with which the Japanese had had considerable experience"—with the implication that we learned from them.

He is too modest. There is a difference so great as to be fundamental between the operations undertaken by the Japs in their drive through the Indies and those in which our forces have been engaged since August 7, 1942. Except at Wake Island, at Milne Bay (which does not fall within the purview of this report), at Midway and in the efforts to throw forces into Guadalcanal east of Henderson Field, our enemies never really had to deal with the problem of the opposed landing. In three of those four cases they suffered monumental defeats.

Their other "amphibious operations" met no opposition in the air and but very little on land. (It is perhaps significant that even Wake, where the disparity of forces was so great, did not fall till the slender force of defending planes had been eliminated; but let's not insist on the point.) The Japanese captures were military movements which were required to be performed with speed and precision, but essentially they were not different from the operations in which we took over the Atlantic base sites secured from England in the fifty destroyer deal of 1941.

Some credit must certainly be allowed to our enemies for correct long-range planning. In all that ocean of islands from The Kuriles to Guadalcanal and westward to the Andamans, the report shows that we have never scored an advance,

never been able to set up a base with an airstrip of our own without having had to fight for the ground. They thought of everything. They occupied all the possible sites, and pressed for time though they were, pressed for shipping though they became, found means to supply every one of hundreds of islands with a defensive installation commensurate to its importance. It was a considerable achievement, but an achievement of the order of building the Alcan highway or the Maginot line. It bore no resemblance to the task our forces faced in taking the islands away from them.

Importance of Planning

Admiral King is vague on the details of how this task was accomplished—so far as it has been accomplished. The part of the report dealing with the specific amphibian operations consists mainly of a chronicle on the order of "planes from a carrier task force bombed X while a landing was effected at Y, and Z was heavily shelled by battleships under Admiral A." This is perfectly reasonable under the circumstances, for the details would doubtless prove as passionately interesting to the boys in Tokyo as they would to us, but even without the detail some conclusions are possible and the Admiral himself has drawn a few of them.

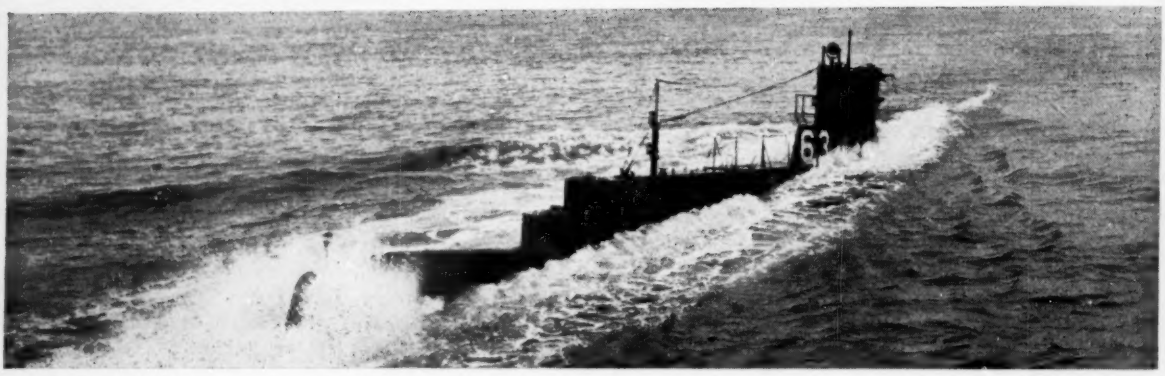
Perhaps the lack of detail is most felt in the accounts of Tarawa and Roi. On the former we get:

"Tarawa was heavily fortified and garrisoned by 3,500 Japanese troops on Betio . . . they had been attacked repeatedly from the air for weeks preceding the assault and on the day before they had been heavily bombarded. In spite of these attacks . . . their dugouts, pillboxes and bombproof shelters were still partly intact. The enemy was able to concentrate his forces beside the only beach where a landing was possible. In spite of fire support from the air and from ships our casualties were heavy." And on the latter:

"Roi was secured and enemy resistance on Namur was confined to the northern part of the island. By the middle of the afternoon all organized resistance on Roi and Namur was overcome . . . Our casualties on the two islands were less than 100 killed and 400 wounded."

What made the difference? A good many people know or think they know, but when this knowledge is boiled down it generally turns out that they are talking about a collection of accidental details. Now war is by no means an absolute science, but in an operation against an enemy who makes a purely passive defense, attempts to impose no plan of his own, as was the case at both Tarawa and Roi, there are no accidents. The determining factors are furnished by the plans of

"Japanese capacity to maintain the war at sea and in her advanced areas has suffered increasingly, due to the loss of vital shipping." A sub crew in firing practice.



"One mistake in Jap strategy lay in overlooking or underestimating American submarines."

the attacker and the scope of his resources. The resources in both cases appear to have been adequate, so it comes down to planning, which in an amphibious operation is a matter of coordination.

Admiral King says as much in another part of his report: "This type of warfare required a technique of its own, involving the closest cooperation of all forces engaged—land, sea and air . . . The inevitable solution to successful amphibious warfare is a unified command, under which system all those participating are under command of the individual best qualified to conduct the operation regardless of his status in our armed forces."

A Combat Team Was Needed

In reaching this point something new has been added to and something old subtracted from the traditional doctrines of command. The subtraction is the old doctrine of paramount interest; for it is substituted the much looser doctrine of the individual best qualified.

Offhand there would seem to lie in the latter a source of the inter-service conflicts and disagreements that the paramount interest doctrine was invented to allay, but the success of the operations carried out under the new system is the guarantee that this is not the case. In fact, the whole report is irradiated on a large scale by an idea that on a much smaller scale has been observable in the program of the U. S. Army—the idea of the combat team, composed of all arms, each being employed according to the demands of the occasion.

For the commander of such a combat team there is required a man of considerable ability as a coordinator, but also one who knows perfectly the powers and limitations of the various weapons at his disposal. Indeed, amphibian warfare, the modern warfare of the Pacific, appears to demand adaptability at any level and among ships as well as among men. In the accounts of the cruiser actions off Guadalcanal one is struck by the way squadrons were made up of heavy and light cruisers in varying proportions, ships which were considered before the war to differ considerably in function. We find battleships serving as antiaircraft vessels (incidently, with intense success), and destroyers on bombardment missions, both in contradiction to prewar practices and ideas.

Among the ships this adaptability is probably a function of the fact that modern naval war has proved to be so much an affair of rapid movement and quick emergencies, but while the war is in progress the causes are probably less important than the effects. Of those effects perhaps the most salient is that what we have really been talking about is the U. S. Marine Corps.

They have been a combat team, if not from the beginning of the Corps, at least since the time when their function as a beachhead force in amphibious operations was foreseen. The suggestion is that if the unification of the services everybody is now talking about ever comes to pass, it should be through the Marineization of both Army and Navy, though it is difficult to conceive of anything so sensible being done when the politicians get to fooling with the idea.

The Marines Were Ready

At all events the report shows that the Marines were fully ready for this new kind of war. Admiral King mentions that the test of Guadalcanal-Tulagi showed Marine Corps individual and unit training methods to be sound; and then, sometime later in the report, that Roi and Namur were taken by the Fourth Marine Division. Apparently he does not realize what a revolution in the Corps, indeed in the whole of our methods of war, is implied in the two statements.

Let's see: in the last war something less than one division of Marines saw action against the Germans, and they were not used as Marines, specially trained troops for a special purpose, but as *stosstruppen,* attack infantry, and far inland. In this war there are not only very many more Marines but they have also very definitely become special service men, with a mission of fighting at the border of sea and land.

At a first glance this would appear to be a uni-

versal alteration running through all the world's military services, a general characteristic of this particular war. Russian marines are mentioned at the defense of Sevastopol; in the Solomons and again in the Gilberts our own marines encountered members of the Japanese Imperial Marine Corps. But on analysis the resemblances vanish.

For both the Russian and the Japanese marines were being used defensively, as garrison troops, not in a single place because a peculiar emergency existed and they were the only troops available, but as a normal and regular practice. According to American thought this is a good deal like using a surgical saw for cutting two by fours. It may be seen as one of the basic reasons, or a reflection of one of the basic reasons, why our forces have been so universally successful in amphibian operations while the Japanese have had 75 per cent flops.

One Plan, or None

What is that reason? Where lies the difference? What makes them fall down? It is not necessary to repeat anything that has been said about the courage and tenacity of the Japanese fighting man. Everyone agrees that he can also be tricky, with a repertoire of amoral nastiness that includes such business as sniping medical men and wiring his own dead as booby traps. But the fact seems to be that the Jap is a tenacious, brave, savage fighting man and nothing else.

He can make a plan far ahead. Its details will be worked out with an almost inconceivable perfection, and he will follow his plan to the letter, come hell or high water. The whole Japanese campaign into the Indies seems to have been laid out far in advance, with charts of every anchorage, tables on who would be boss of what village and what kind of money they would use, with the money already printed. Factors of safety were provided so that the operating units need not be thrown off the track by losses. It is a long voyage from Yokohama to Tulagi and it is clear from the King report that the original occupation group for the latter point must have been pretty well wiped out in the first moves of the Battle of Coral Sea in May. Yet when our expeditionary force arrived in early August the replacement force was on the ground and the airfield had all but been completed with hand labor alone.

But with all his military virtues the Japanese seems to have one military defect and that a fundamental and a fatal one. He never has more than one plan; only the variations on it are tricky. Over the period of this report his adaptability has been insignificant. He built up a corps d'elite in his marines but he could think of no better use for this corps than to put them in stations where the fighting was likely to be hard, which meant keeping most of them out of action and exposing the rest to being picked up in detail by forces superior at the point of contact.

Two Japanese miscalculations have been referred to. The second one was the assumption that we would do the same, that we lacked flexibility to the Japanese degree. One often hears that we do not understand Oriental psychology, but has anyone given a thought to the idea that they may find our mental habits quite as incomprehensible a mystery? How else could they have ventured on the Pearl Harbor attack? The success of that attack must have been fully up to their wildest expectations and they gained a gratuitous extra advantage with the sinking of the *Repulse* and *Prince of Wales*. The literature of the prewar days told them with fair degree of accuracy how we meant to fight a war in the Pacific and now we lacked the means to fight that war.

From all their past experience, from all the past history of their wars with Russia, with China and far back, with the Tartars, they had no reason to suppose that we could adapt ourselves to such circumstances and rise out of them. The fact that our navy has done so and is doing so has faced them with a new form of war which they had no plans to meet. It is the real reason why they have been avoiding battle and why Admiral King, after having made due reservations for the length of the way ahead, can conclude his report with; "The war against Japan has gone increasingly well." **END**

One of the U. S. Navy's myriad destroyers streaks along in the early morning at sea.

Smoke—The Modern Armor Captured

German documents reveal in precise detail the high degree to which the Wehrmacht has evolved the tactical uses of smoke. The author of the well-known volume "Gas Warfare" analyzes these documents. *By Brig. Gen. Alden H. Waitt, Chemical Warfare Section, U. S. Army*

SMOKE is the modern armor. Used in the First World War with much success after 1915 but in a comparatively limited way, it has come into its own in this war and is proving to be one of the indispensable munitions. Few commanders now fail to take advantage of protecting smoke screens, although these screens sometimes complicate operations and call for added planning. The fighting man learns rapidly and has been quick to recognize the value of smoke.

Smoke is especially valuable on the offensive but there are many times when it may be employed in defense. Properly used, it is impossible to overestimate its great advantage. Wrongly used, it may do more harm than good. It requires observation and regulation. Its use must be coordinated with adjoining units, lest it blow over advancing friendly troops and cover them at the wrong time and cause confusion.

Smoke Prevents Observation

Smoke is most effective when placed upon or close to the enemy observation. It is used to deny information, to reduce fire effect and to hamper movement and operations. It has been called a two-edged sword. It presents its dangerous side, however, only to the unintelligent user. Its benefits to the wise commander who understands it are incalculably great. It denies the enemy the advantage of observation, but at the same time it may keep friendly forces from seeing him. It places the enemy on the alert. This fact may be used to call the enemy's attention to the wrong place and cause him to expend ammunition needlessly. Smoke generally draws fire, and may be used to draw the enemy's fire toward unimportant areas.

An enemy depends upon observation for most of his information of our activities. Proper use of smoke will deny this observation, certanly so far as ground observation is concerned. A smoke screen may make it possible to move reserves, to bring up weapons, shift positions, and assist in obtaining surprise. Observed fire is the most effective fire. If it is possible to place smoke on an enemy, he can be denied the advantage of aimed or observed fire and thus his fire effect will be reduced.

There are three principal methods for producing smoke on the battlefield. One is by burning a smoke producing substance; another is by the explosion of a shell containing smoke material; and the third is by spraying into the air a chemical which will form a dense cloud.

There are solid smokes and liquid smokes. Typical of the solid is WP (white phosphorus). Phosphorus combines with oxygen so readily that if exposed to the air it will burst into flame and form a heavy white smoke. WP is important as a smoke producer but because of its burning effect on personnel and material it is also an effective casualty producer. In shell, bombs, and grenades, phosphorus is an extremely effective munition, useful for many purposes.

Another solid smoke used by all armies is HC mixture. HC is a combination chiefly of zinc powder and hexachlorathane. Small amounts of other chemicals are added to control the burning. HC mixture is used in smoke candles, pots, grenades, bombs, and shell. The zinc and the hexachlorathane combine under the influence of heat generated by a fast burning starter to produce a heavy grayish white smoke.

Typical of the liquid smokes is FS (a solution of two acid materials—sulphur trioxide and chlorsulphonic acid). FS is an excellent smoke producer, the smoke resulting from a combination of the particles of FS with moisture in the air. Although the smoke is harmless, it will irritate the skin and the throat slightly, and it is very corrosive to metals and fabrics. It is used chiefly from airplane spray tanks. As the liquid flows from the tank, the drips are broken up by the air stream into a spray which, combining with the water vapor in the air, forms a dense cloud. FS also has an important use in artillery and chemical mortar shell and in frangible grenades. In the shell a small bursting charge sprays the liquid into the air.

Another liquid smoke is FM (titanium tetrachloride) which acts in the same way as FS. It is less irritating and corrosive but costs more.

German Smoke Tactics

The Germans have used smoke from the beginning of this war and have skillfully exploited its many advantages. Their practice in the use of smoke in combat is much the same as our own. They consider smoke as an accessory to other weapons rather than a weapon in itself. It is interesting to note that they have not made use of

WP, which has a great capacity for producing casualties as well as acting as a highly effective screening agent.

Captured documents reveal German technique in great detail. With reference to the effect of weather, wind, and terrain on smoke shoots, German doctrine is practically identical with ours. The German method of attack under the cover of large area smoke screens, however, goes far beyond our American practice. Plans for use of smoke covering an entire division front are worked out with typical German thoroughness and are described later in this article.

Attack Under Area Smoke

As given in a German manual entitled *Der Angriff unter Einsatz von Flächen-nebel,* the term "area smoke" means the use of smoke to cover an extensive area so as to resemble conditions produced by a thick natural fog. It is an important accessory in an attack against an enemy prepared for defense on a stable front, in a field defensive position, or behind a water obstacle.

Area smoke creates a zone of decreased visibility in which, and into which, observation and observed fire are rendered either difficult or impossible, except at close range. It therefore favors close combat with infantry in a leading role. In order that the enemy may not have time to rearrange his defensive strategy to prevent penetration of his lines, surprise is a most important factor in attacking under area smoke.

Uncertainty as to what may be mixed with the smoke will probably compel defenders to wear gas masks; the attacker can fight without them. The attacking force closes with the enemy and utilizes gaps in his fire to achieve a break-through, storming particular enemy strong points to neutralize them. In this way, the attackers crash through the depth of the main field of battle. The attack troops must be specially trained and equipped for fighting in smoke. At the same time that the enemy's planned defensive fire is interfered with by the smoke blanket, their higher command will be able to have little influence on the course of the action.

Preparations

Suitable jumping-off positions for this action will be occupied previous to the main attack. Thorough reconnaissance and preparations are made before the attack under cover of area smoke. The attacking units must have as clear a picture as possible of the nature of the terrain to be crossed and details of the defensive capabilities of the enemy. Gaps between the attacking divisions make it easier to emplace the artillery and deceive the enemy.

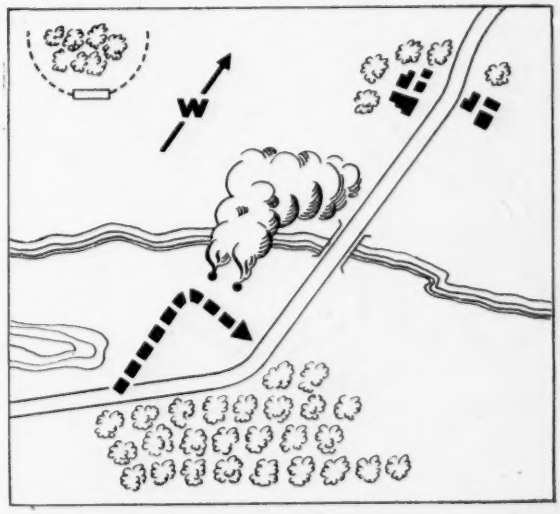
The main objective of the attack is the enemy's artillery positions. If the main battle zone is of great depth and strength, it may be necessary to decide upon intermediate objectives, which must be easily recognizable in the smoke, i.e. roads running at right angles to the advance, intersecting streams and the like. This makes it possible to correlate the laying of the screen with the progress of the attack.

Prior to the laying down of the smoke screen, the artillery must lay down a thorough, destructive bombardment to soften the area attacked. High ground, suitable for observation posts in the vicinity of the battle zone should be blinded by artillery or mortar smoke shell. Enemy artillery must be neutralized while the attacking forces are reaching their positions prior to the attack and throughout the course of the battle.

Ground leading up to the battle zone must be already occupied and cleared of obstacles and mine fields, so that no lengthy delay will be met. The attacking unit is brought into position the night before the attack in near positions. Paths and roads approaching the battle zone must be so marked that an unimpeded approach is certain even after the smoke has drifted over them. Attacking units come to the jumping off point in open order.

Early morning hours are most favorable for the beginning of the attack. The approach of the attacking units can be preceded by a fairly long area screen bombardment on the forward approaches of the main battle zone. A mixture of smoke and HE fire can be maintained until the infantry attack approaches the area of the screening. If occasion arises, the rear observation posts of the enemy can be blinded at this same time.

The area screen is laid down in zones 650-1,000 feet wide across the axis of attack. Its rate of advance will be governed by the difficulties anticipated in the respective zones of the fighting and



An advance guard is determining whether houses at upper right are enemy-occupied. Drawing fire, it ignites smoke candles and withdraws under smoke cover to the woods.

from the nature of the ground, averaging about 650 feet per 15 minutes. Once this screen has been set in motion, it must adhere to the time-table laid down in advance.

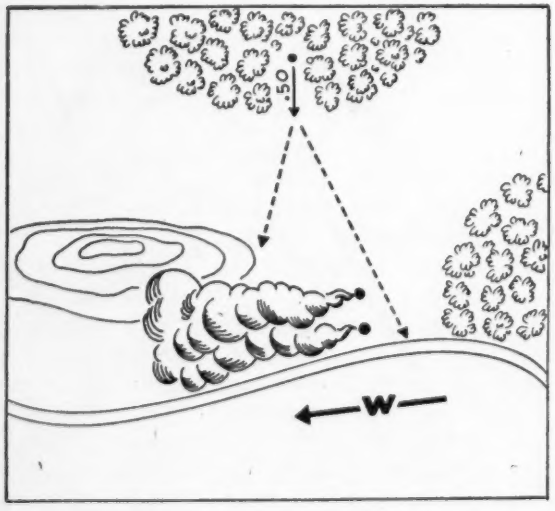
Attack units make effective use of smoke by keeping close up to the screen, in order to carry attack forward under cover of the smoke. At this stage, visibility should be kept to hand grenade range.

A head-on wind gives the attack the best smoke protection. Lateral wind also offers possibility of use of area screens, by launching some of the smoke into sectors which are not being attacked. However, a wind blowing in the direction of the enemy is unsuitable as it precludes use of screen for close combat. In order to deceive the enemy, the screen must extend over the flanks of the attacking area. The screen can be supplemented during the attack by the smoke equipment of attacking units (smoke hand grenades and candles and smoke shell from infantry guns.) These types of equipment, especially smoke candles, should be freely supplied.

Units Used: Their Coordination

The divisional commander allots the objectives to the infantry commanders and also gives the artillery their tasks. The area screen is laid down by smoke units and artillery working together under the sole command of the artillery commander, on the basis of coverage and time schedule for the screen outlined by the divisional commander.

The infantry regimental commander gives the battalion the particulars of their attack and the objectives of the break-through across the main zone of battle. He puts under the command of the battalion such further weapons as are necessary to carry out their tasks, including anti-tank guns, infantry guns, direction indicators and special weapons. After the break-through on the main battle zone, he quickly collects those forces of the regiment which have become scattered during the attack so that they may be used in a co-ordinated manner. Those forces which are assigned to attack defensive works need combat engineer units with their specialized offensive equipment, individual armored vehicles and arms for the engagement of pill boxes. The battalion commander goes forward with the troops engaged in the break-through and is responsible for their progress through the battle zone.



A bicycle scout squad receives fire from woods at top. Taking cover in the ditch and lighting smoke candles, they are able to proceed to the cover of hill at left.

Anti- tank guns are used by the assault groups for the reduction of pill boxes, and other obstructions on the way through the main battle zone. Radio apparatus, even for lateral communications, is necessary during the course of the fighting in the smoke-covered area. Additional signal units are attached to provide communication under the difficult circumstances of this type of fighting.

Reconnaissance aircraft are employed to report the effectiveness of the screen and reconnoiter the terrain beyond. Dive bombing attacks are used against enemy battery positions and against assembly areas or moving columns of enemy reserves. During the assembly of the attacking units, anti-aircraft defense is provided.

An attack begins with the entry of the infantry into the main battle zone. It may be necessary to launch assault group attacks against individual and particularly harassed defensive positions on the near edge of the main zone of battle, to facilitate a way into its depth.

Assault Troops and Artillery

Assault troops are thrown in at points where the obstacles of defense and terrain offer favorable conditions for thrust through the main zone of battle. During the battle, the assault groups must rely upon their own resources. Their strength must be enough to insure that they can fight across the main battle zone, over the whole of their allotted sector and reach the far side as units, strong enough to continue active fighting. Assaulting units are organized in groups capable of maintaining a simultaneous advance despite the diversities of the tasks which may be met in their particular sectors of the battle zone.

When the infantry is nearing the rear of the main battle zone, the artillery takes up the task of affording the necessary fire cover for the spearhead of the attack as it comes into view out of the smoke. At this point, enemy forces coming up to the far side of the main battle zone must be neutralized by bombardment for annihilation. Advanced artillery observers, with field telephone apparatus, accompany the most advanced elements of

the attacking infantry. They communicate with the artillery liaison officers at the battalion headquarters. During the advance through the smoke, they signal to the observation sections at prearranged times by means of vertical light signals as a guide to the extent of the objectives which have been attained.

Directional Equipment

Great stress is laid on the importance of the attacking units being properly orientated at all times to prevent confusion when visual observation is strictly curtailed. The following means of maintaining direction are suggested.

1. The magnetic compass.
2. Radio beam operated by a transmitter and several receivers working in conjunction with it. The transmitter is set up at the jumping-off position and lays a radio beam about 65 feet wide through the smoke in the direction of the objective. The receiver, by listening in, can ascertain at any time whether he is in the radio beam or has deviated to a flank. A special unit of the signal service, attached to the commander of the attacking forces, operates this equipment. They function with the leading units in the attack.
3. Direction shells which scatter colored powder (red, yellow, blue) are issued to the infantry gun companies. These rounds are fired before the attack at intervals of about 165 feet along the path of the attack, which is thus marked by colored patches.
4. Signal lines (about 1000 feet in length) are carried by rockets in the direction which it is desired to mark. Their range can be extended by firing another line from the end of the first one, on the same bearing, using the gyro-compass. These mark the path of the attack group to the most advanced position.
5. The gyro-compass.
6. Direction tapes in various colors mark the paths taken by staffs or units through the smoke. They facilitate report traffic, the maintenance of contact and the forward movement of later units. Markings in the direction tapes give the troops fighting within the screen an indication of how far they have penetrated from their starting points.

The employment of these direction indicators, the allocation of the individual colors and the briefing of attacking units must be clearly laid down in the combat orders.

Follow-Up of Attack

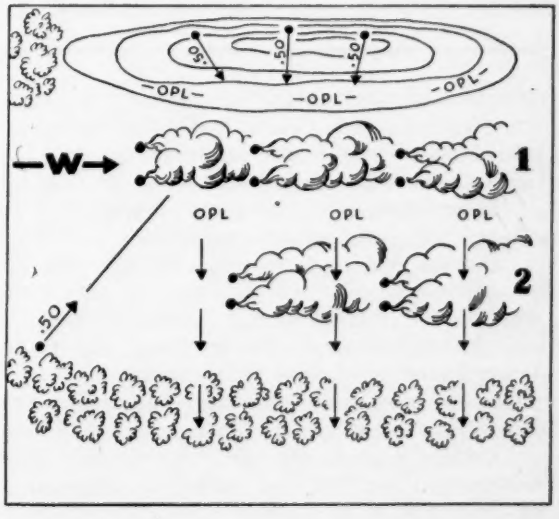
As soon as the attacking units reach the far side of the area screened, it is necessary for them to reform in order to carry out immediate attack on the objectives which are usually beyond the area screened. Anti-tank guns must immediately provide anti-tank defense. Tank units which have been held in readiness are brought through the newly captured area to attack enemy artillery positions and enemy reserves which may have gathered. This allows time for the infantry to reorganize its forces which have become somewhat scattered. Reserves are also poured through this break in the enemy lines to exploit the situation and make possible an application of maximum strength against the enemy on the far side of the screen.

Generally an area screen is used against an enemy defending himself behind a water obstacle only if there is little or no current and the stream is narrow. Peculiarities of smoke over water must be taken into consideration. Maneuvering of ferrying equipment is carried out under protection of smoke. The first wave to be ferried over will be those attacking groups which are to deal with the most forward works on the opposite bank. The timetable for the smoke barrage must take into account the fact that the troops ferried over the water have to form up on the hostile bank before the thrust into the main battle zone.

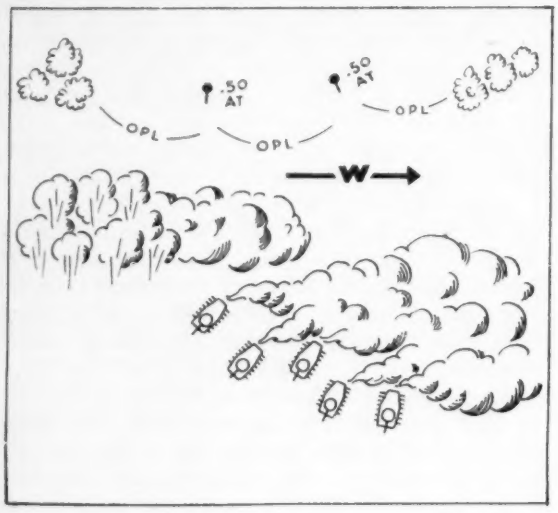
Smoke on the Maginot Line

The Germans apparently have followed the manual closely in actual practice in at least one large operation. A description of the use of smoke by the Germans in the penetration of the Maginot Line appeared in an article by a Colonel Kanzler in the *Deutsche Allgemeine Zeitung* of Berlin, dated May 22, 1941. The article told of a smoke unit which had been assigned a mission at the strongest point of the Maginot Line between St. Avold and Saaralben. This action followed closely the principles defined in the German manual, *Der Angriff unter Einsatz von Flachen-nebel,* from which the illustrations for this article were taken.

The permanent steel fortifications and field for-



Retrograde movement begins under Screen 1. Screen 2 is soon set up to give unit time to reach woods at bottom. Plunging machine gun fire also covers withdrawal.



In Defense

Tanks withdraw while screened with their own smoke. The flank vehicles are screened by smoke from an artillery battery. It will be noted that this calls for quick realization by the artillery O. P. of the need of the tanks and a knowledge of how to use wind direction to produce the desired subsidiary screen.

In at least one instance during the North African campaign, simple but effective use of smoke was made by a German tank unit. Part of an Allied armored division was brought up to help stem a German advance. They succeeded in ambushing a column of German tanks. Some damage was inflicted and the Germans withdrew, laying down a smoke screen. The commander of the Allied force waited for the smoke to lift, thinking it could not last long. But it persisted and since the terrain did not permit by-passing the screen, he gave orders for his tanks to proceed through. Once the American tanks were silhouetted against the screen on the other side, they became perfect targets. The Germans took full advantage of the opportunity and fired on them with everything they had, inflicting considerable damage before finally being driven off.

The Germans have also tried some interesting experiments in the use of smoke hand grenades to make tanks vulnerable. Their Blendkorper 1H and 2H, frangible glass grenades with a filling of FM, are probably designed specifically for anti-tank use (but might be used also against pillboxes). By breaking smoke grenades over air-intake openings they believe that it may be possible to force the crew to evacuate the tank, or, if masked in time, at least to make handling of it difficult. They have experimented with tying a smoke grenade (not the Blendkorpers but probably grenades with time fuzes) to each end of a six- or seven-foot rope which is thrown across the barrel of the tank's gun.

The foregoing examples illustrate some uses of smoke in defensive warfare. Techniques and examples of the use of smoke in attack are given on the next page.

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tifications of the French were located on high ground behind wide basins of dammed-up water. Wide rows of barbed wire in the swamp land adjacent to the water basins, and along the edge of the basins themselves, gave the impression that an approach to the enemy positions or a crossing of the water was impossible. The French, who felt themselves secure behind concrete and steel, were able to direct the fire of their machine guns and rapid-fire cannon against every knoll and every depression of the ground before them.

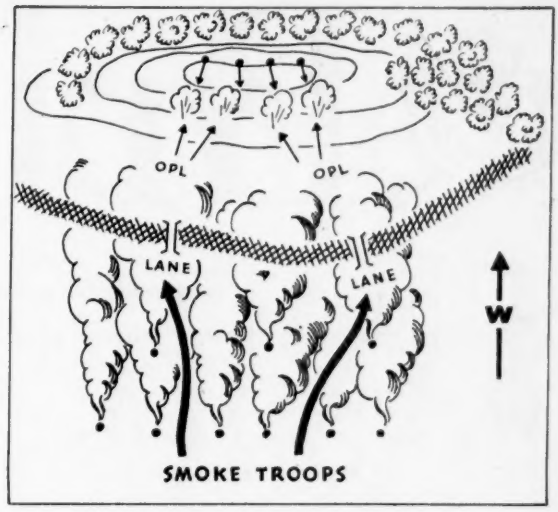
The German division artillery commander ordered the smoke battalion to screen the line of hills and the slopes on the far side of the bottoms. The southeastern exit of the village of Remering, which was strongly fortified by the French, was also to be enveloped in smoke so as to prevent observation. According to the plan of attack the fortified heights of the French were to be "blinded" in order to make it possible for German infantry to detour them on both sides and then destroy them from the rear. This made the employment of additional strong infantry and artillery units unnecessary. In particular, smoke was to make it impossible for the French to direct accurate fire at the flanks of the attacking infantry. It was to be used to help save blood.

The smoke battalion maintained a screen over an area 2,200 yards long and 450 yards deep by firing one round every fifteen seconds from each weapon. This battalion was equipped, at least in part, with five-inch mortars. It had forty tons of ammunition available for use in its attack against the Maginot Line. In the words of Colonel Kanzler: "Our employment was a convincing success. We were very much pleased to hear the words of praise coming from the assault troops and the heavy weapons engaged in this battle . . . The smoke screen on the morning of the second day of the battle made it possible for the infantry and

In Attack

Wire barricades exist in front of the enemy machine gun positions. Under cover of smoke, lanes are cut. (In prolonged activity in dense smoke cloud, the gas mask is put on.) The screen is extended to the front by smoke troops, using smoke candles which the wind direction permits. Both flanks of the nest are attacked under a light smoke screen. A few smoke grenades are thrown in front of and into the nest.

In a large scale attack on an enemy line, similar procedure is recommended. Enemy strong points are covered with a heavy smoke blanket and the attacking forces envelop the positions from both flanks and reduce them from the rear.



The technique is similar to that against machine gun emplacements, with some interesting modifications. The assault is preceded usually by a concentration of artillery fire, one purpose of which is to make craters in which an advancing combat engineer detachment can take cover. When the assault detachment reaches wire barricades surrounding the pillbox, a Verey signal calls for all available artillery fire to be laid down on the pillbox. Smoke screens are laid down by grenades or candles. Men with wire-cutters or bangalore torpedoes open lanes through the wires. Verey signals call for a cessation of artillery fire against the pillbox and a flamethrowing detachment advances through the lanes in the wire and attempts to get within five or six yards of the pillbox. They are covered by accompanying machine gun fire. As soon as the flamethrowers near the end of their fuel, they shout a warning and men with bangalore torpedoes advance to the embrasures and detonate their charges therein (the charges are said to be effective even if embrasures are closed.) If the pillbox still holds out smoke candles may be thrown in to make the air unbreathable or an attempt is made to blow in the roof with a heavy charge.

Readers who have seen action in the Pacific and in Italy during the past year will note a close resemblance to our own methods in the two foregoing examples.

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pioneer assault troops to approach the artificial lake, and for two assault groups to cross the lake on inflated rubber rafts.

"A platoon leader of a 10.5-cm. assault battery reported that under cover of the smoke he proceeded with his armored weapon to within a few meters of the enemy bunker at the entrance to the village of Remering and put the bunker out of action by firing into the embrasures.

"This brilliant success was not only due to favorable local conditions, but also to years of experiment with this weapon and the thorough training of officers and men which commenced winter before last."

The principles set forth in the German manual make it clear that their use of smoke tactically follows in general our own standard practices except that it goes much further in the case of large units attacking under cover of area smoke screens. Further they appear to be more inclined to operate in their own smoke than we do. It is apparent that the Germans have given considerable thought to the difficulties of both the offensive and defensive forces in this type of action.

They lay great stress on careful coordination of the several arms engaged in the action and on the difficulties of constantly maintaining direction in the smoke. It would seem that one of the requirements in a large scale smoke operation of this sort is control of the air over the area attacked.

An alert defense might upset this type of attack by counter-attacking before the assault units have time to re-organize on the far side of the screen. No matter how careful their planning or how effective their directional equipment and communications may be, some confusion is sure to be present at that time, making them extremely vulnerable. It is nevertheless my belief that an attack by a large unit under cover of area smoke is worth careful consideration. **END**

Britain's

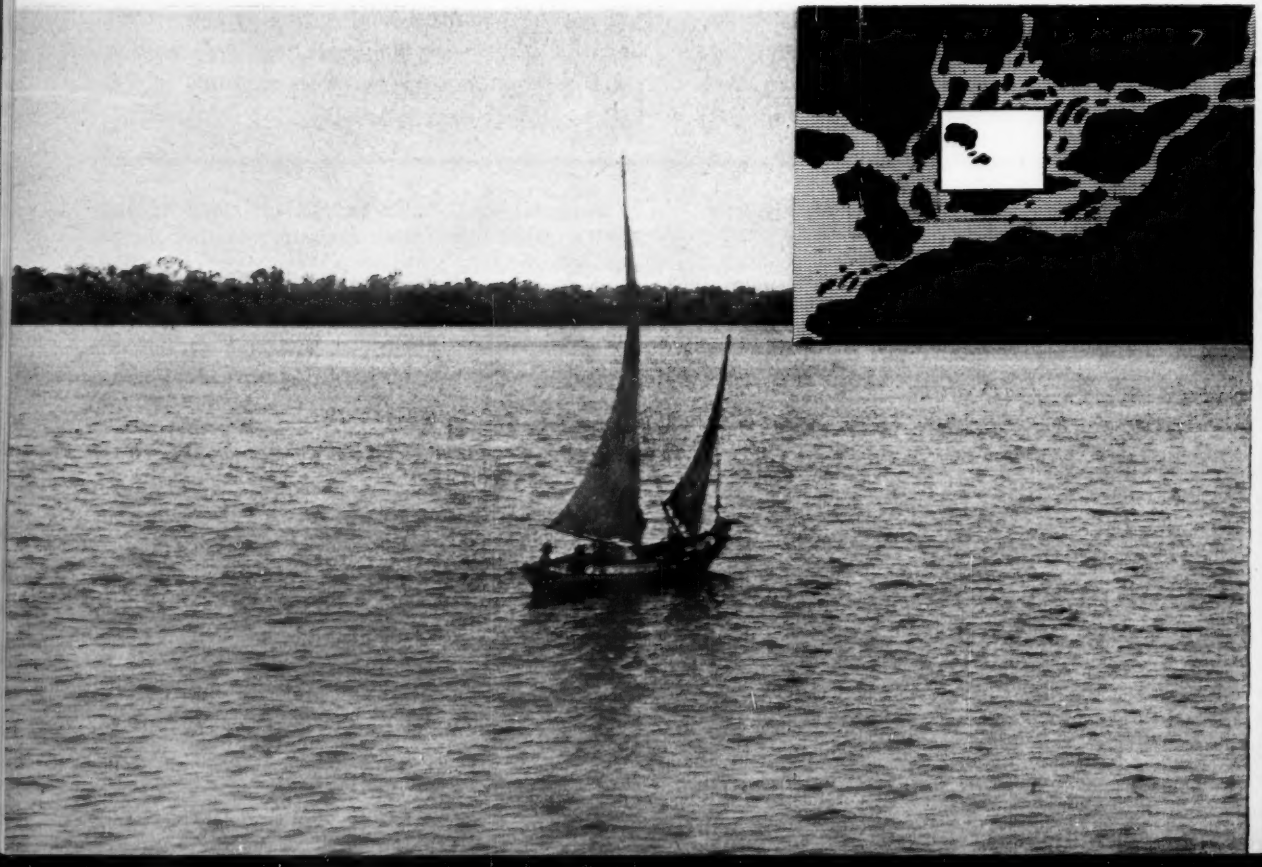
A comprehensive analysis of the functions, duties, and performance of her fleet of ships as reported by an official agency of the British Government.

WE KNOW that the earth is a globe and we have been told often enough that this is a global war, that is, a war which covers the whole area of the globe, be it water or land. Nevertheless most of us, when thinking of the globe's surface, tend to consider the land rather than the sea spaces; for most of us are more familiar with the solid part of the earth, the rocks and mountains, plains and cities, than with the liquid part. Yet more than two-thirds of the earth is composed of salt water. If you compared the earth with a chessboard you would find that forty-six out of the sixty-four squares would represent water. But even those eighteen squares of land include a lot of water in the way of lakes and rivers. There are lakes whose shores are more than a hundred miles apart, where ships have foundered in heavy gales with all hands, and there are rivers whose banks are more than fifty miles apart. Yet these lakes and rivers are all contained within that part of the world which is land, and outside the "land masses" there are still the vast sea spaces.

It is across these huge sea spaces that the communications linking one part of the world with another must run. The world is kept together because routes have been charted across the seas; in the past, the untravelled seas completely cut off one part of the world from the other.

A world war involves not only the quarter of the globe that is land, but also the three-quarters of the globe that is sea, and the outcome of such a war will depend on who controls the seaways—

"Rivers whose banks are more than fifty miles apart." The Amazon: A map of Malta superimposed on a chart of the Amazon estuary shows the vast area occupied by the river's mouth.



s Sea Power

who can command the sea communications which link the various parts of the world to each other; for now the world is joined so closely together the situation has changed from what it was in the days of Elizabeth and Philip of Spain, or even of Nelson and Napoleon. Then, command of the sea was important; now it is essential.

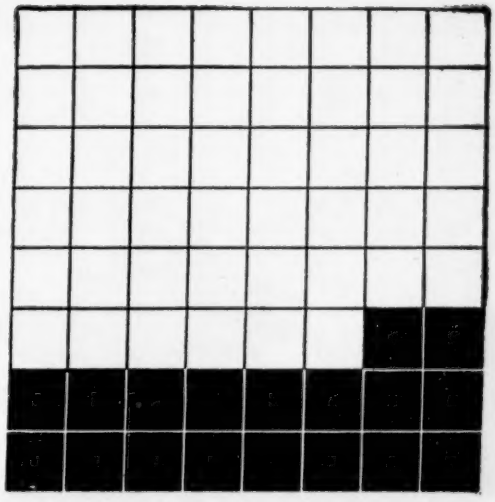
Control of the Sea: What It Means

Control of the sea today by a country at war means simply that shipping which is friendly to that country can be protected when it uses the sea routes, and that unfriendly shipping, or shipping which brings goods to the enemy country, is prevented from using them. The country which aims at this control must be able to supply the warships which protect the friendly merchant vessels and which can prevent the others from getting through. This is not just a matter of owning the ships; it is a matter of owning ports, harbors, fueling stations and estuaries as well. For control of the sea is exercised by the possession of, or access to, these sea bases from which the navies can put out and to which they can return.

When the ships and bases are provided, however, there will still be the enemy to contend with. From his own bases he will send out fleets to dispute the control of the seas with his opponent. So each side endeavors to create a more powerful fleet than the other. Out of this contest the modern capital ships have been evolved: the battleship and the cruiser.

The major work of the battle fleet, centered upon the battleship, is to meet and beat the naval forces of the enemy. In Nelson's navy the Line of Battle was formed from the most powerfully gunned ships in the fleet and the Line of Battleships (from which the name battleship is taken) fought it out, gun against gun, bulwark to bulwark, and finally, man to man. Once the victory was won, the defeated side had no ships left afloat capable of disputing control of the seas.

In a general way the country with the most powerful ships has the same advantages today; but there are other factors to be reckoned with now. One is aircraft, which can seek out and destroy shipping by bombing and torpedo attack, and the other is the submarine, which can destroy it by torpedo attack. And both the aeroplane and the submarine are equipped to evade direct attack.



Comparing the earth with a chess board, 46 out of 64 squares will represent water.

There is another function of battle fleets—and this is an immensely important one to the United Nations in this war. It is to ensure the safe passage of men and weapons across the seas—and not merely to get them across but to keep up a steady stream of supplies and reinforcements.

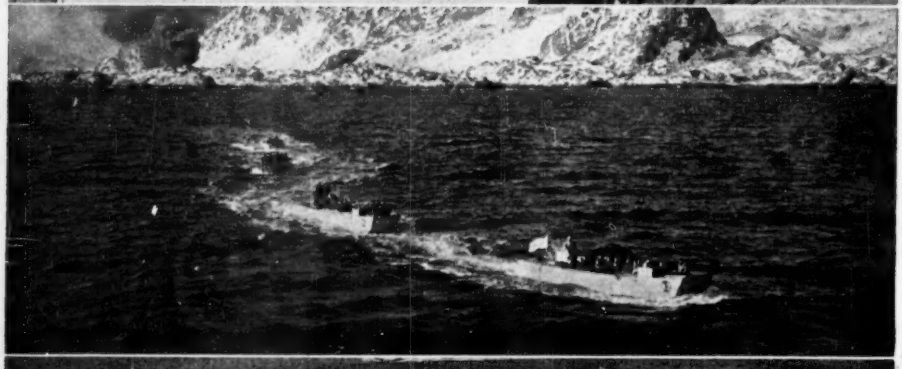
The need for control of sea communications is, therefore, the basic reason for the existence of battle fleets and battle fleets exert a very great effect upon wars; the wider the scope of the war, in fact, the greater effect the battle fleet has upon it. The only limits to the extent which sea power can affect the final issue are the limitations on the completeness of the sea power itself. It will be decisive, if it is complete, because it gives its possessors supplies, mobility, surprise, tactical opportunity and extra offensive power.

Productive Power and Manpower

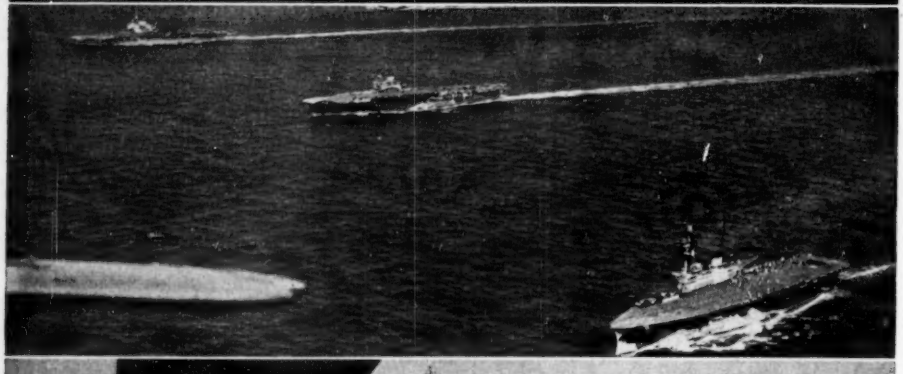
In a world conflict, the supply problem bulks larger than any other. Modern armies can only move and fight by drawing upon basic materials in food, fuel, and industrial output. Materials such as oil, coal, iron, metals, rubber, measured in millions of tons, are the very sinews of war. Great industrial populations, which must be fed

SUPPLY

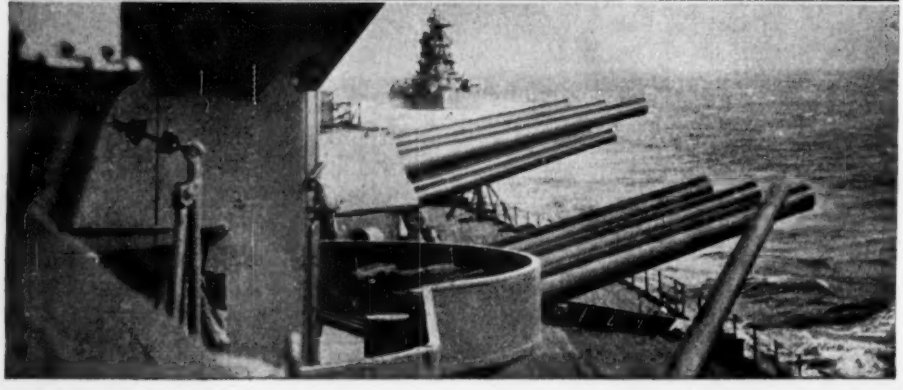
MOBILITY



SURPRISE



INITIATIVE



OFFENSIVE

and clothed, are harnessed to the munition plants and draw manpower away from agriculture. So unless the victory is gained very swiftly after war breaks out, production power and manpower become the decisive elements in waging the war and the side which has the sea power is the side which can rely upon getting the resources it needs.

Mobility

The famous Confederate general who described strategy as "to get there fustest with the mostest men" (General Bedford Forrest) summed up one of the most vital factors in winning battles. The Nazis may have thought they were inventing a new idea when they launched the blitzkrieg upon the world, but there was in fact nothing new about it, and now the magnificent thrusts of the Soviet Army on the Eastern front and the movements of the British Eighth Army in the south have given new examples of the value of mobility in war. Mobility is also of the greatest importance when an outnumbered army must be saved from destruction. The successful evacuation of the British Army from Dunkirk and the way in which the Soviet Armies were time and again suddenly withdrawn into the huge wastes of their hinterland, leaving the Germans baffled, deprived the enemy in each case of full success. So the mobility which sea power gives is of supreme importance in a war which is being fought all over the globe.

Surprise

This depends to a large extent on mobility. The Allied landing in North Africa could not have been made, if the enemy had gathered any foreknowledge of the plan. Surprise is comparatively easy to maintain at sea because the vastness of the oceans and seas can never be completely surveyed. Not only surprise itself, but the threat of surprise is essential to keep the enemy guessing.

Tactical Opportunity

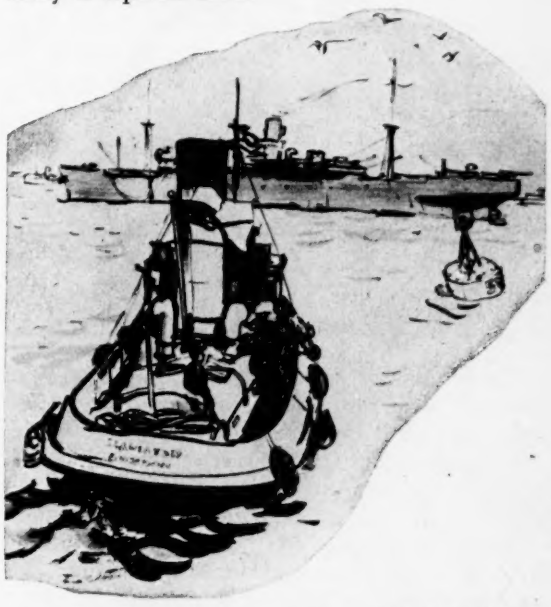
Strategy and tactics are closely linked, but tactics are more concerned with the progress of operations once the battle has been opened. At sea, the power to choose your battleground and force your enemy to meet you there is likely to be decisive. Whichever side possesses sea power can force the enemy to fight on land at any given time and at whatever place to which it chooses to transport and land its armies. So the side possessing sea power has also the advantage of being able to plan a military campaign ahead.

Extra Offensive Power

When sea power has brought all these advantages to its possessor, there still remains the particular fighting strength of the battle fleets and their great weapons. No mobile land artillery can be compared with the great naval guns. A modern battleship of the George V class can discharge in a single broadside some ten tons of penetrating, high-explosive shell fire with perfect accuracy across a distance of twenty miles. Smaller naval units can put ashore considerable forces of fighting men, and aircraft carriers can hold the air long enough until airdromes ashore are captured. All this makes up the extra offensive strength which naval power contributes.

Sea Control and the Present War

The present war is being fought in all five continents, most of them separated by sea space: in North Africa, in Eastern and Western Europe (at the gateway of Asia), Eastern Asia (in Burma, Malay and China), in New Guinea (impinging upon Australia), and on the Pacific Seaboard of America (by the threat of Japan from the Pacific). In fact, it has been the aim of the Axis to stretch the limits of the war into every part of the world, in the hope that the Allies would have to deploy their forces so widely that they could be dealt with easily as separate units.

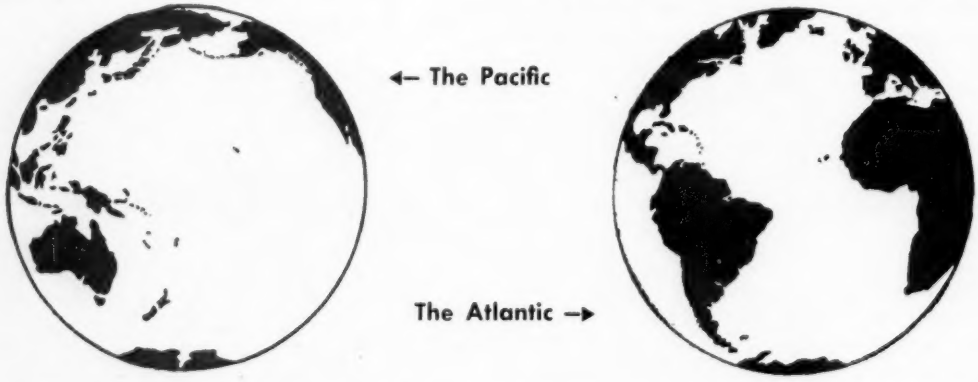


Against the Axis forces are marshaled the forces of the British Commonwealth, the United States of America, China, the Soviet Union and their Allies dispersed over the world from South America to Central Africa, from Iceland to the edge of the Antarctic, from Canada to India, from Australia to Panama, from Iraq to the Arctic Ocean, from the center of the Pacific to the center of the South Atlantic.

No four Allied powers could possibly be more remote from each other than are Britain, United States, Russia and China, and all are dependent upon the common pool of war supplies for the means whereby they fight. It is essential that these supplies reach them, and reach the remote fronts

on which they are used; this means that the seas must be free for the use of Allied shipping, and that again means there must be powerful ships to protect the shipping. For instance, when Russia was desperately in need of supplies and weapons, an endless stream of merchant ships loaded with war material passed from Britain to Murmansk—each convoy escorted and protected there and back by warships of the Royal Navy, running the gauntlet against continual German naval and air attack.

It will be seen, then, that the range of sea space which the Allied fleet must watch, patrol and keep clear of the enemy is enormous—far larger than the area which the "flat" projection of the world (with which most people are most familiar) leads one to imagine. The very extent of the area provides difficulties, for it is impossible to survey and patrol continually such a huge space. On the other hand, from this very difficulty the sea power which the Allies hold can take certain advantage. A good example is the landing of the Allied troops in North Africa in 1942.



These landings involved 850 ships—by far the greatest concentration of shipping upon a limited objective ever known in the history of the world. The concentration was a target of stupendous importance for the Axis air power—it was a vital objective. To that small corner of the continent of Africa ships came "from nowhere"—they came from the whole expanse of the North Atlantic, and the area of ocean which can be surveyed by shore-based aircraft does not begin to cover this great expanse. None of the ships from Britain was lost.

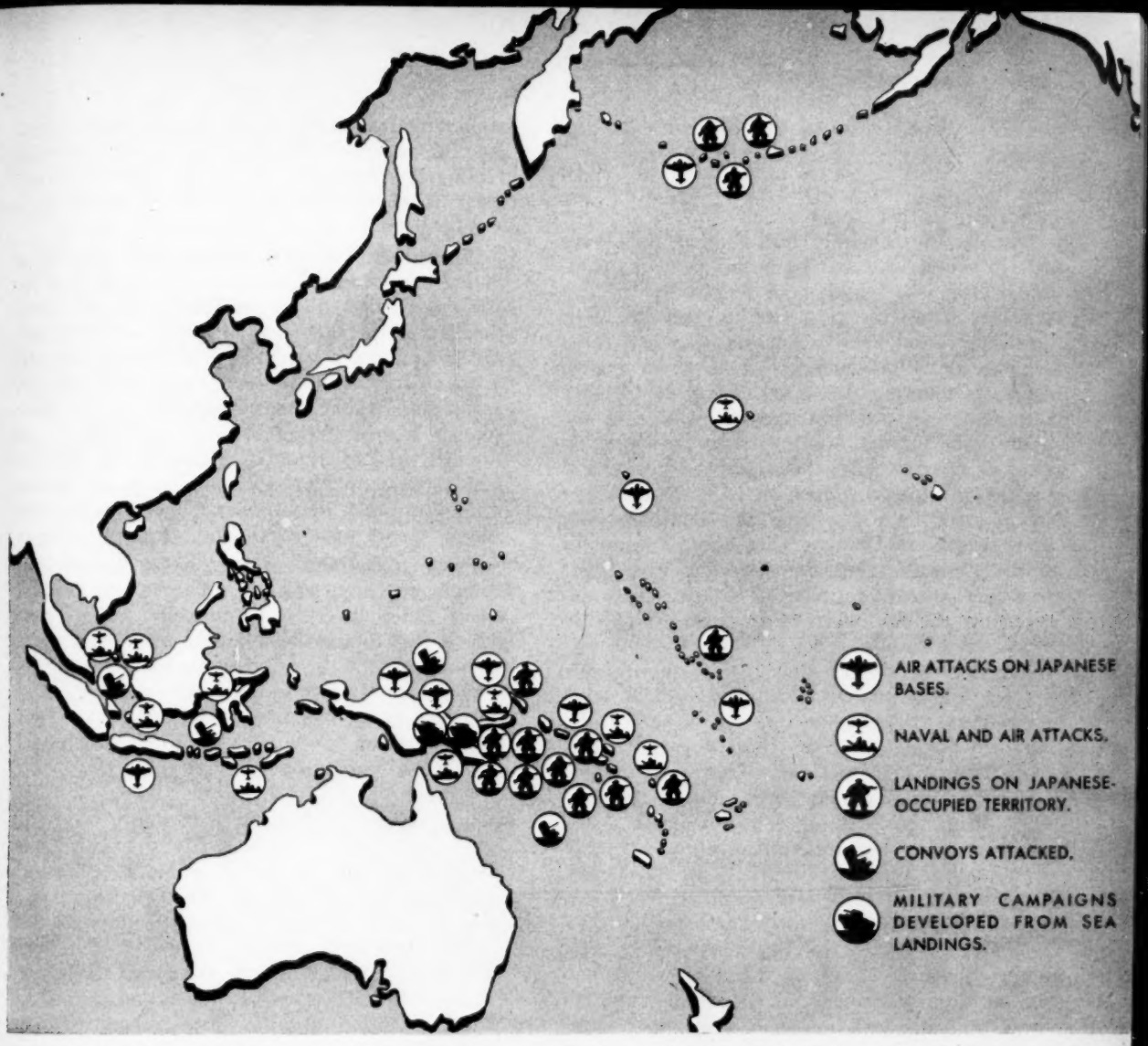
Ocean space has operated against the Axis in another way—against the submarine. These vessels were intended to cut the vital sea communications between Britain and America. Because of the great distance they must cover to carry out this deadly work, it would be a greater advantage to them if they could be refueled and reammunitioned at sea by disguised merchantmen operating from neutral ports, for then short-range submarines could be designed as smaller vessels and could be produced in far greater numbers.

Moreover, their losses would be less for they would not need to return so often to their bases along the heavily patrolled coasts of Europe. This trick was tried out by the U-boat command early in the war, but so many of these U-boat "depot ships" were sunk by the Royal Navy that the scheme has now been almost abandoned and ocean space has turned into a liability for the enemy by forcing him to send his submarines thousands of "nonoperational" miles to their zones of action.

Not possessing sea power, the campaign of the Axis to spread the Allied fleets over the great sea spaces turned to their disadvantage. Germany did not possess, early in the war, a battle fleet that could compare to the Royal Navy. In the case of the *Bismarck*, for instance, the Germans sent out into the "ocean space" a monster capable of destroying most single vessels afloat and certainly able to inflict irreparable damage upon Allied shipping and communications. If she could have roamed one month in the Atlantic, the losses she could have inflicted would have surpassed anything that a dozen packs of U-boats could have done in a year. But when she ran through into the Atlantic, orders were immediately issued that she must be sunk at all costs. Ships of the Royal Navy were assembled from all over the Atlantic and the North Sea. After five days' breath-taking chase she was cornered and sunk.

The war in the Mediterranean was a sea war fought as Nelson would have fought it. It was the proper application of sea power to land power. The enemy's sea communications were interrupted and his "inner circle" of sea-borne traffic—along the bights and bays of the Adriatic, around the Greek island, to and from his African territory—was harried and sunk.

The huge zone of the Pacific was drawn into the area of seapower's conflict by Japan's attack, and Japan's early successes were themselves due to sea power, but since then the Allied sea power has taken the offensive. A Japanese fleet was crushingly defeated by the United States air and naval units as it moved over the Coral Sea. Another great concentration of Japanese warships and aircraft was intercepted and dispersed off Midway Island in June, 1942. The Japanese sea communications based on Guadalcanal were seriously dis-


AIR ATTACKS ON JAPANESE BASES.
NAVAL AND AIR ATTACKS.
LANDINGS ON JAPANESE-OCCUPIED TERRITORY.
CONVOYS ATTACKED.
MILITARY CAMPAIGNS DEVELOPED FROM SEA LANDINGS.

The Pacific was drawn into the area of sea power's conflict by the attack on Pearl Harbor. Allied sea power has now taken the offensive. Map shows initial actions taken.

rupted when the Allied invasion forces captured the island. Again in March, 1943, a seaborne Japanese expedition off the coast of New Guinea, conveying an entire division, was completely destroyed by Allied aircraft, leaving not one ship afloat.

Convoy to Russia has bulked large in the priorities allotted to the tasks of British sea power; convoy to the Middle East theater of war, by the long sea route around the Cape, was able to pour into the desert battlefields a weight of offensive metal and men which drove the German and Italian forces right out of Africa. The Axis forces were supplied across the short sea passage from Italy to Tunisia, Bizerta and Tripoli, Benghazi, Sollum and Tobruk. The entire Italian navy and substantial forces of the German air force were in operation to keep those routes secure, yet against British sea and air power they were not able to replenish the supplies of the Axis armies sufficiently to match the British Eighth Army. Through the whole campaign, too, the British Mediterranean fleet was able to keep the island of Malta supplied with food and weapons, pushing its convoys through the enemy guard and enabling Malta to be a "thorn in the side" of the Axis communications to North Africa.

Sea power has been brought to bear in naval support of land operations upon enemy territory and in naval support in Combined Operations (Commando raids). Norway, France, North Africa, Greece, Crete, Malta, Iceland, Libya, Italian Somaliland, Sicily and Italy—in all these actions sea power has thrown its weight in behind the fighting troops. The control of sea communications has enabled the Allies to make their moves at will—without weakening the naval forces allotted to other tasks.

Above all, Allied sea power has prevented the German and Japanese forces from joining hands in battle at sea or on land, and on that hope the Axis dream of domination largely rested.

The Tasks of the Navy

What are the men and machines, the ships and their equipment, upon which sea power depends if it is to be maintained?

The landsman hardly realizes that the larger part of the Navy's activity, of sea power's operational task, is a monotonous toil of day by day activities. The lives of sailors are very rarely lit up by the publicity which follows the news of a great battle. Nine-tenths of their lives consists simply of standing alert day and night while they keep their eyes and ears open for a sign of the enemy. The physical strain this work imposes on men is so heavy that they must be young and healthy and highly trained in order to endure it and to stand up to the gales and hurricanes they have to face—which are even more formidable than the enemy's guns. For a warship is designed with the primary purpose of fighting, and can give only the minimum of space to living conditions and comfort.

The vessels of war which, working together, make up the instrument of Allied sea power, cover a vast range of types and they can be most easily classified by the jobs each type of vessel undertakes. Thus various kinds of warships are allotted to the ten most important branches of naval work—battle reconnaissance, patrol, convoy, supply, minelaying and minesweeping, coast defense, coast bombardment and training. In considering the work which the fleets undertake it is also worth remembering an important factor in naval strategy, that is, the difference between "narrow waters" (which can mean coastal seas, shallow and difficult of navigation, partially covered by shore guns at points and concentrations of shore-based aircraft) and "open seas"—the ocean space, remote from shore control—where sea power reigns undisputed. When assessing the work of naval vessels and their accomplishments, the difference between operating in narrow and open seas has to be taken into consideration—a vessel, fighting within a restricted space where sandbanks, shallows and tides may limit her maneuverability, may be severely handicapped. Large naval units feel most secure on the open seas. And it is here, on the open sea, that the Allied naval power has mostly operated. Neither air power nor submarine menace has been able to minimize the power of the fleet in its own element.

A Battle Squadron

A modern battle squadron consists of a number of battleships escorted by cruisers and destroyers, with, probably, aircraft carriers operating many miles away. The battleship is a floating fortress equipped with devastating fire power. Everything aboard her contributes to the feeding, manning, protection, carrying and range-finding of her guns. A modern battleship will destroy lesser ships from a range at which they are unable to make reply and her speed is such as to make it difficult for lesser vessels to close in or extend the range to a safe distance.

As battleships move into action, far-flung screens of fast destroyers search the ocean space for the adversary, helped by reconnaissance aircraft from the battleships and their attendant cruisers, and try to slow down a retreating enemy by torpedo attack. Cruisers, also speedy, but more heavily armed and armored than destroyers, try to make contact with the enemy force and draw it off towards the capital ships. Aircraft from the distant carriers, moving seven miles to the fastest ships' one mile, also cooperate by engaging the enemy forces with bomb and torpedo.

Apart from their tasks in battle action, each component part of the squadron—battleships, heavy and light cruisers (normally cruisers with 8-inch and 6-inch guns respectively), destroyers, aircraft carriers—have other duties and it is seldom that they would be grouped for battle action. Now and again, several ships of varying types will group together for special operations; often they will operate singly or in couples.

Convoy Work

Of all the jobs given to the Navy in time of war, convoying is perhaps the most continually urgent. Allied merchant ships loaded with men, supplies and munitions are drawn from thousands of different ports scattered along the free coasts of the world. They are assembled and herded together at secret meeting places; then they are gathered into orderly formation and sail together under the protection of small warships—mostly destroyers and corvettes. When they come into range of aircraft they receive the additional, very effective protection of Coastal Command seaplanes.

It is a simple idea but in practice it demands the most exacting work, at headquarters and in every ship involved, before the convoy sails. And once it sets sail in its orderly and impressive procession, the work of every man on every ship is an intense and uninterrupted strain. A continual watch must be kept, and contact with the other ships must be maintained, without a glimmer of light by night and through days and nights of fog and bad weather. Nothing, not even a U-boat attack, can be allowed to interfere with the convoy's steady progress. No matter how gravely a ship is imperilled by mountainous seas, the master cannot heave to, as he would in peacetime. He must go on. If he founders he will not be blamed and deprived of his certificate (as he would be in peacetime) but it is unlikely that he will live to be praised. The men and ships in the convoy are all expendable; only their cargoes count.

There are never less than 21,000 ships of the British Merchant Navy on the high seas and these are protected all the time by over 600 ships of the Royal Navy, with aircraft of the Fleet Air Arm and the Coastal Command. The men of the Allied navies together have brought across the high seas over three hundred million tons of cargoes and three million fighting men have been transported under the protection of the Royal Navy alone. Of these only 11,348 have been lost at sea. Only one soldier has been lost out of every 2200 who have safely landed with their arms.

Patrolling

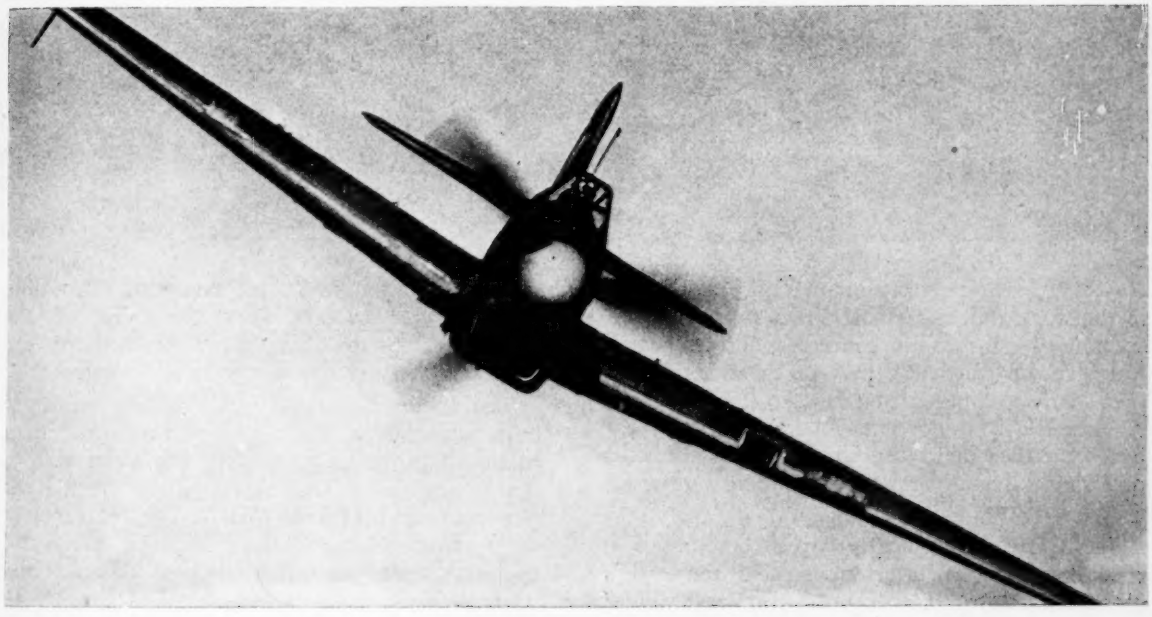
In addition to the duties of escort and convoy protection, the Navies must keep constant watch on enemy ship movements. His battle fleets must be pinned in their bases, or attacked and sunk should they venture forth. The long sea route from Britain to the Middle East war center, round the whole African continent, the Red Sea, the Indian Ocean and the great areas of the Pacific Ocean down to Australia, must be patrolled.

Minesweeping and Minelaying

The work of a minesweeper is not glamorous, but it is of the highest importance and extremely dangerous. The men of the Patrol Service who carry it out are drawn from all walks of life—fishermen, yachtsmen, stockbrokers, bartenders, the crews of the sturdy fishing trawlers which sweep the coastal seas clean of the mines dropped by enemy aircraft. When an invasion force sets sail, it is the minesweepers who steam ahead to make the way clear for the transport ships and invasion barges. As the mines are laid, so they are swept away. The minesweepers go out at dawn and return at dusk if they have been lucky, passing sister ships going out to take up night duty. Minesweepers now are equipped with anti-aircraft guns and have accounted for a surprising number of aircraft.

Mines are laid to trap the enemy too. Continual Allied air raids upon enemy and enemy-occupied railroad yards have driven the Nazis into shipping lanes for their transport round the coast of Norway, Holland, and Belgium. Mines are being laid in enemy coastal waters night after night and the enemy has little in the way of small ships to clear them away.

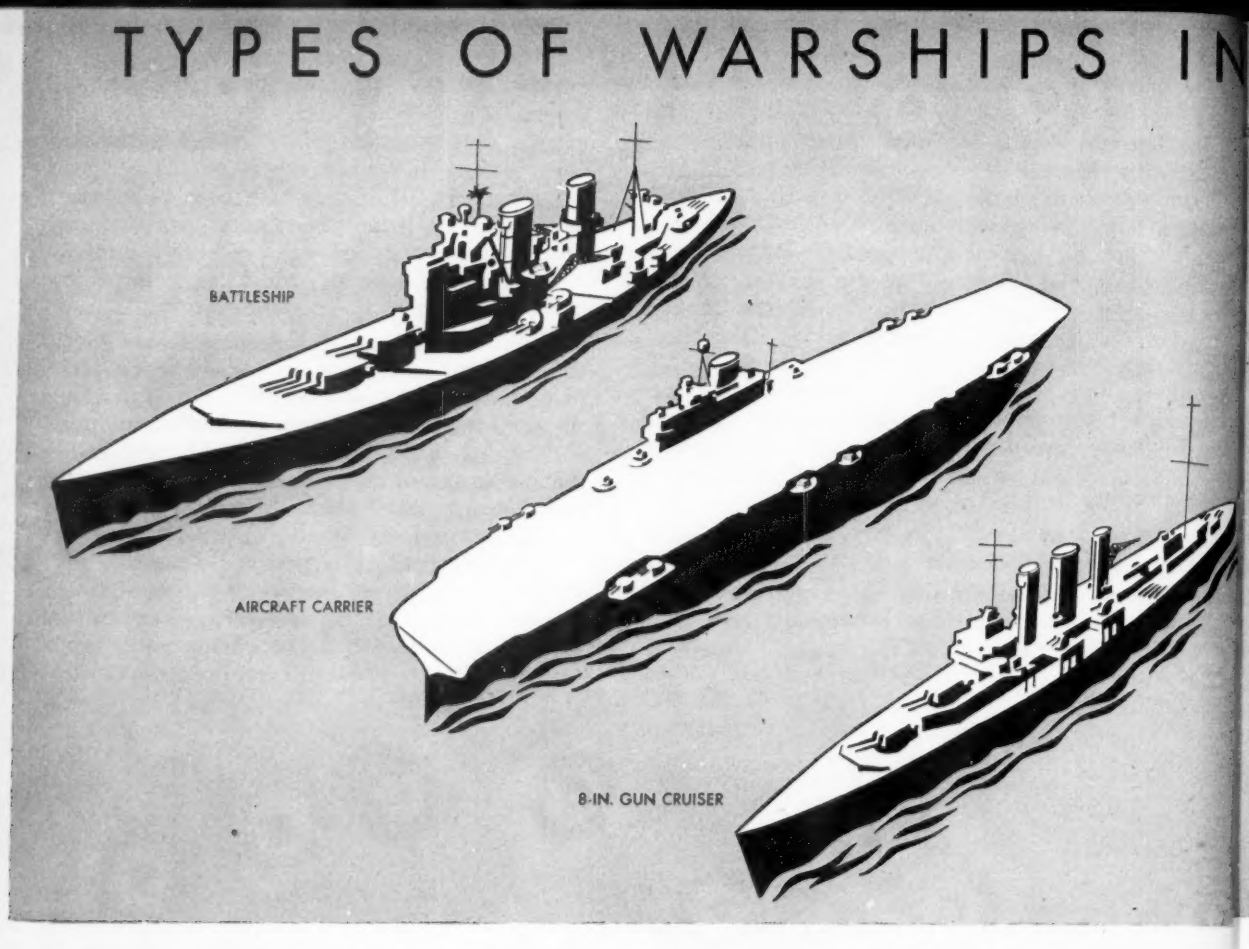
Light ships and navigation marks must be protected and maintained by the Navy. Prevention of enemy access to the trade and resources of the world overseas and to the benefits of water transport round the European coasts must be enforced by boarding shipping at all control points, by the inspection of cargoes and the issue of navicerts to neutral cargoes which bring no benefit to the enemy. A huge concourse of ships of every tonnage and type is engaged on these tasks—part of the daily routine of sea power in action.



Sea power's scope has been extended by the airplane. A fighter dives to attack.

Naval Action

In order to understand sea power in action, it is necessary to realize the significance of a "fleet-in-being." This is a principle of naval strategy which means that a powerful battle fleet exerts its influence simply by existing—even if it does not put to sea at all. The British and United States



Navies are the strongest combination of sea power in the world, but nevertheless they must take full account of all possible concentrations of enemy forces in any particular part of the world when they are disposing their ships over the ocean spaces. Against the winning of any particular naval engagement they must carefully weigh up the risks of losing valuable ships in case their supremacy is lost with the ships.

The German fleet is a powerful combination, a "fleet-in-being" which includes some of the world's biggest warships. It is kept continuously under surveillance lest it should intervene in the war at sea to the disadvantage of Allied control of sea communications; that control is, of course, carried out by dispersed, and therefore often locally weak, sea forces. The Japanese Navy is the third largest in the world. It represents a "fleet-in-being" which exerts tremendous influence on the strategic problems of the present war in the Pacific.

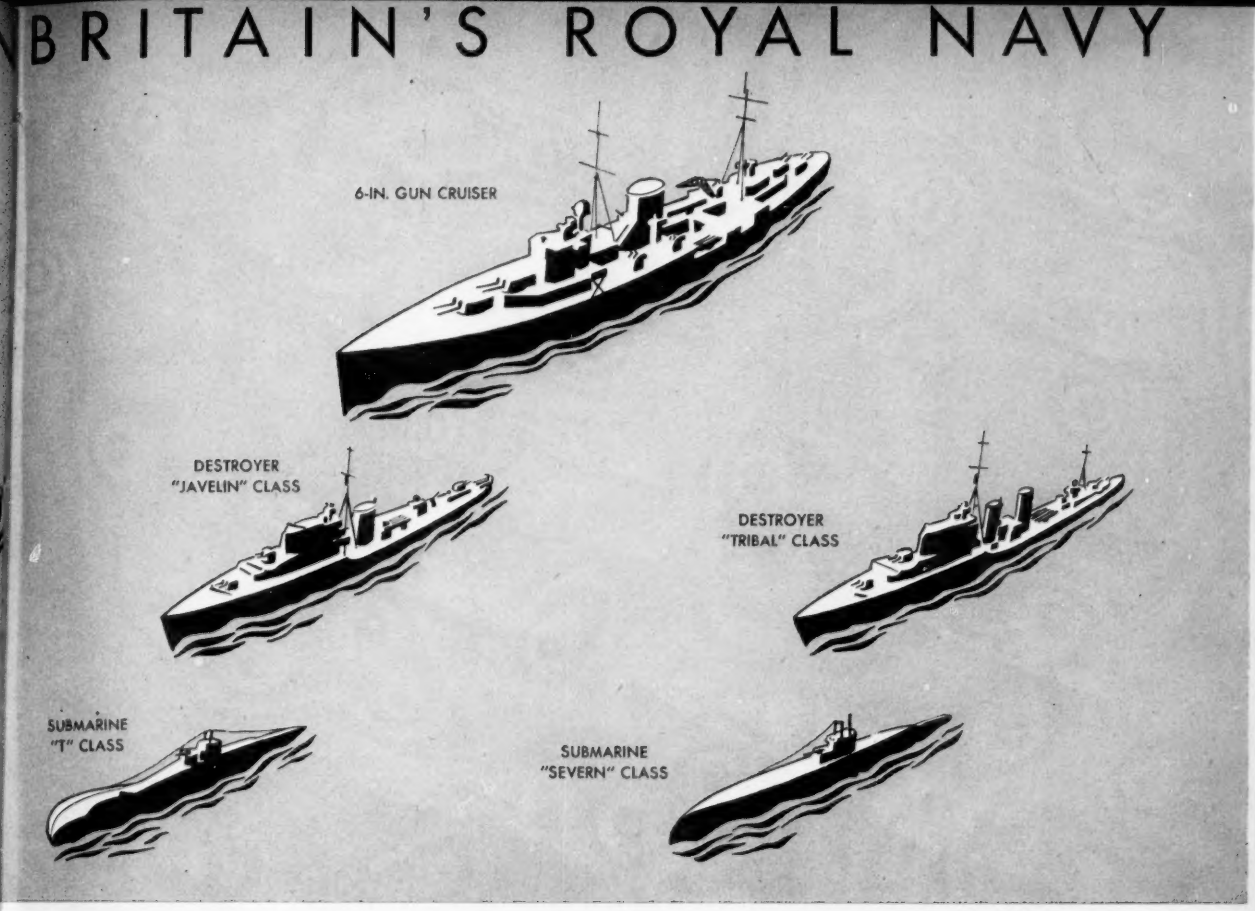
The Principle of the "Fleet-in-Being"

The first principle of naval strategy is to have a "fleet-in-being" and to preserve that fleet intact and afloat as far as possible. It is a significant fact that in World War I there was only one major naval action at sea—the Battle of Jutland; and in the four years of this war the Royal Navy has fought only three major sea battles, and two of those were fought against single big ships—the *Bismarck* and the *Graf Spee*. The third was the battle in the South China Sea in which the *Prince of Wales* and the *Repulse* were sunk together.

The Battle of Jutland was a bloody battle on both sides, but it was a final victory for Britain inasmuch as the German Navy was never able to put to sea again. That single battle affected the whole course of World War I. The remnants of the German Fleet fled back to their bases and by being forced to remain in port, they left the whole balance of sea power in Allied hands.

The Engagements with the "Graf Spee" and the "Bismarck"

The *Graf Spee* was considered by the Germans to be revolutionary in her design and purpose. Her speed could enable her to avoid anything except aircraft, and her guns could sink almost anything afloat. She was a threat to the convoy routes and it was not long before the Admiralty decided she must be sunk at all costs. The Admiralty had taken note of this formidable newcomer and, in 1929, they had laid down a class of cruisers with much smaller guns than the *Graf Spee*, but with double the rate of fire and superior powers of maneuver. When the *Graf Spee* was at last located in the South Atlantic, two of these small cruisers, H.M.S. *Ajax* and H.M.S. *Achilles*,



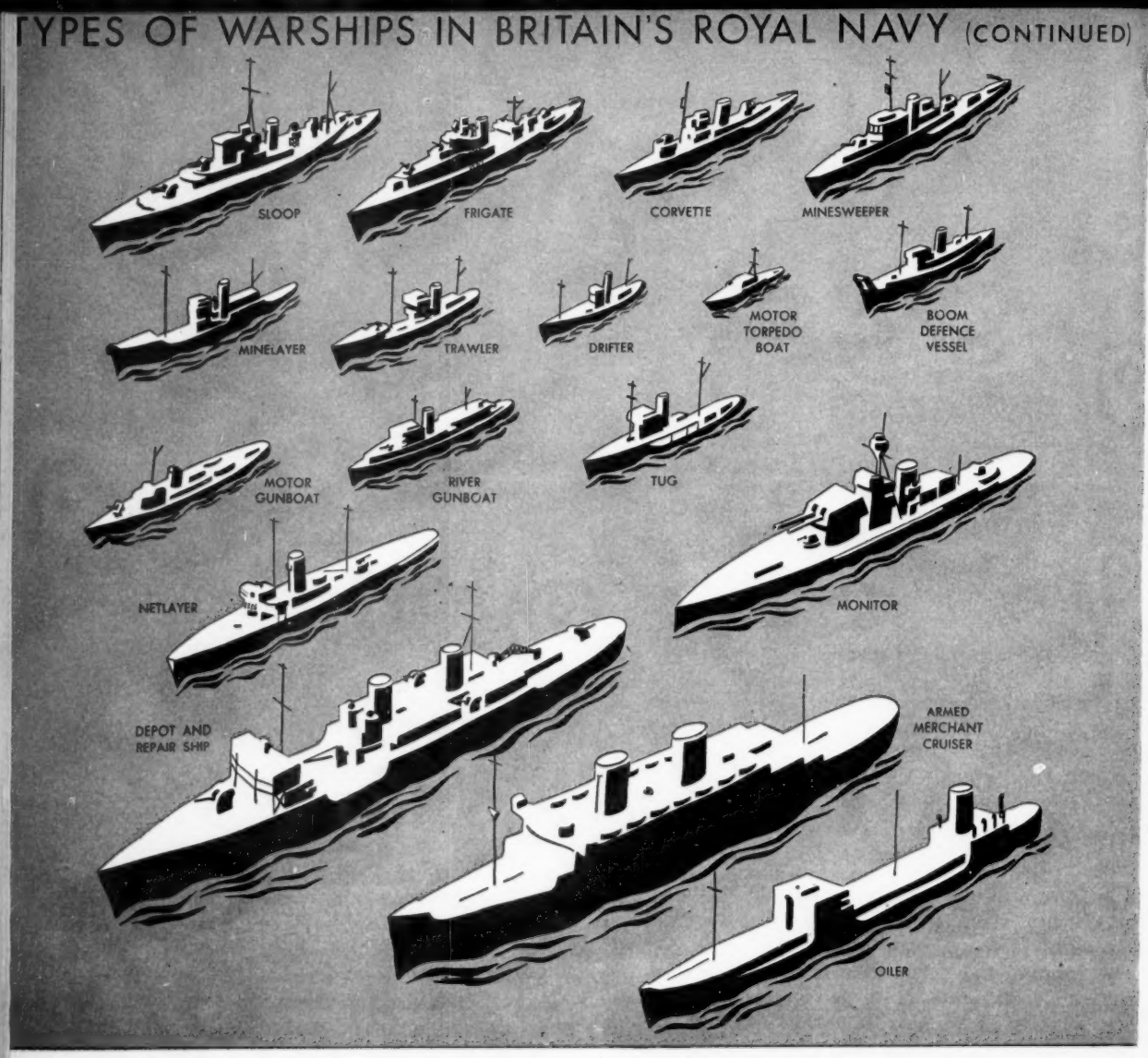
went into action against her under the command of Captain Harwood aboard the slightly larger but older "County" class cruiser, H.M.S. *Exeter*. The running fight that followed was a spectacular affair, but the most spectacular part of it was the way in which the heavily armored German ship of 10,000 tons with 11-inch guns, having disabled the little 8,000 ton *Exeter* (who had only 8-inchers), then turned and ran before the even smaller *Ajax* and *Achilles*. Those two cruisers knew that they had only a very slender chance of disabling the big German ship before they would be sunk themselves, but with brilliant maneuvering they dashed in and out, making use of sunlight, cloud shadow, smoke screens and the lay-of-the-land, pouring their small shells into the control tower of the German ship from such close range that she was blinded and driven ashore. Under the direct orders of Hitler, she scuttled herself, and the commander committed suicide as a final proof of his lack of fortitude.

Atlantic Convoys Relieved

The death of that big ship at the hands of those small "sea terriers" was hailed as a remarkable sea victory. The tactics and sheer audacity of those two 6-inch gun cruisers against the weight of the 11-inch gun German ship will be long remembered in naval history, but the death of that ship meant far more than another sinking—it meant that the convoys in the Atlantic were relieved of their most serious threat and the sister ships of the *Graf Spee* would think twice before they put to sea.

A long time elapsed before the German battle fleet tried another assault, but they still had trump cards in their ports—those huge marine monsters of the *Bismarck* battleship class. These ships were designed for short sallies only and with the idea of creating the utmost damage in the shortest time in the narrow waters around the shores of northwestern Europe. Unlike the British ships they were never intended to face the contrasts of arctic and tropical waters or the rigors of a two-year patrol round the world. They were so built that the comfort and security of the men was never considered beyond the time limit of a month at sea, and when they were in port the men lived in comfort ashore. That sacrifice of cruising range gave them the advantage of armor protection, and since the ships were never intended to be at sea for more than a month at a time they could well afford to enclose the men in a honeycomb of what they hoped would be impenetrable steel closets.

These ships, together with the sister ships of the *Graf Spee* and a strong force of fast cruisers and destroyers, formed a powerful combination that could inflict untold harm upon the Allied Atlantic convoys. They could only be effectively



attacked and sunk by being persuaded to come out and fight. In this fact lies the whole potential importance and magnitude of a naval battle. The only ships that could fight these ships were other battleships of equal strength; but, if the enemy refused to come out and fight out the issues upon the high seas, then his fleet must be kept bottled up in its bases by the threat of other big ships in the vicinity. (It may be thought that they might be sunk in port by bombing from the air, but that is not so easy to do. The anti-aircraft guns of a big naval ship can raise an almost impenetrable curtain of fire which, coupled with the protection afforded by fighter aircraft, forces the attacking aircraft to fly too high. This was proved only too clearly by the ultimate escape of the two German heavy cruisers, *Gneisenau* and *Scharnhorst,* from their uneasy berths in the port of Brest where they had been bombed continually for more than a year.)

The *Bismarck* was the first of these German monsters to come out, and when she was first spotted on the move by air reconnaissance, the big ships of the Royal Navy were gathered to intercept her escape into the Atlantic. H.M.S. *Hood,* Britain's biggest battle cruiser, was the first to overtake and meet her, and the battle opened at a range of nearly fourteen miles in the Denmark Straits, between Greenland and Iceland. H.M.S. *Hood* was the first to get the range and strike the *Bismarck,* but fifteen minutes later a lucky shot from the *Bismarck* penetrated the magazine of the *Hood,* and within three minutes the *Hood* vanished. The battle now developed into a chase down the whole length of the North Atlantic as the *Bismarck* ran for the shelter of Brest, through heavy seas and fitful patches of sunlight for four days and four nights over a distance of 1,750 miles. It was a relentless pursuit with every available British ship and aircraft in action. The pursuers at last closed in for the kill and she went down, a torpedoed and pulverized hulk. H.M.S. *Hood* had been continuously at sea for more than twenty years, pursuing her lawful course upon the waters of the world. But the *Bismarck,* the enemy of the law and the pride

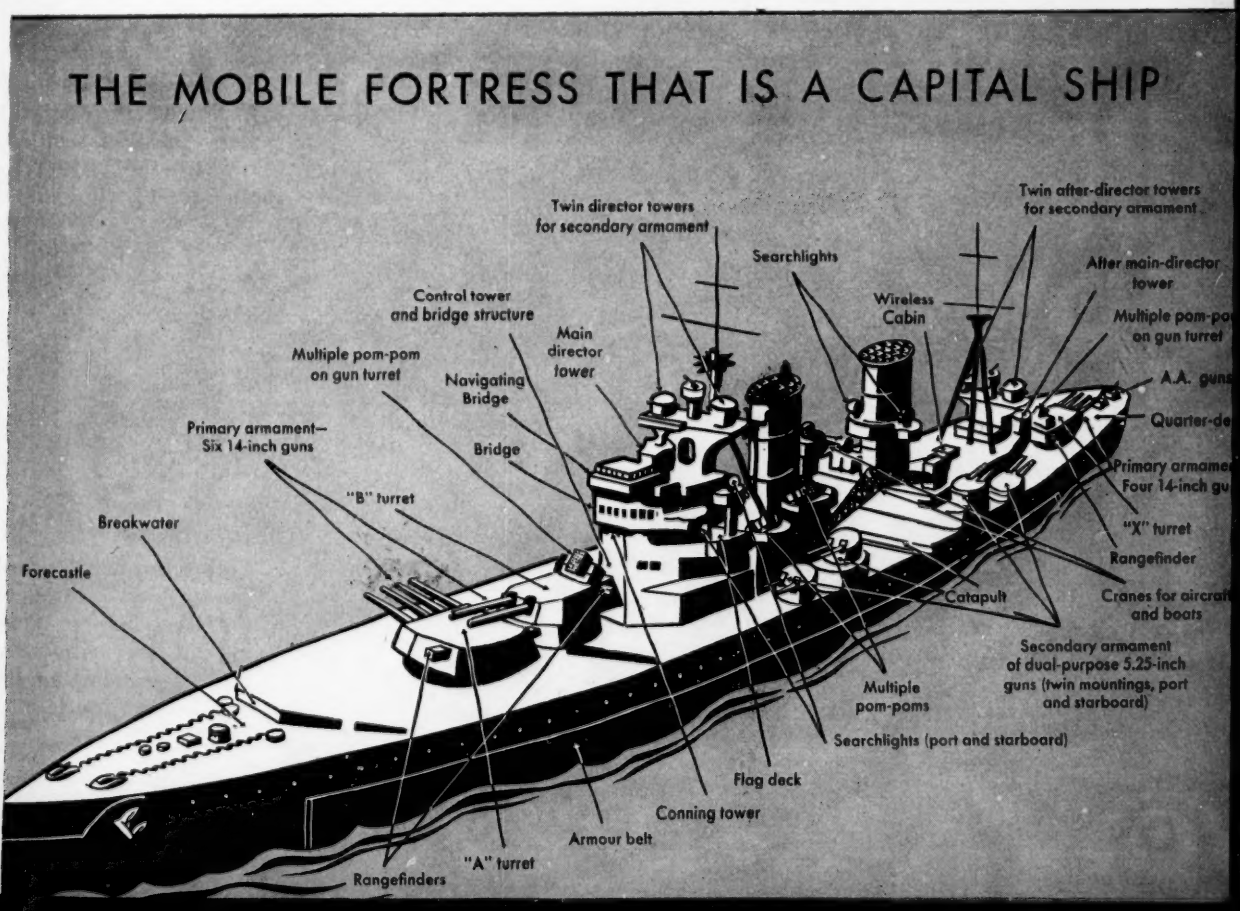
of Germany, was at sea for only five days before she met her doom.

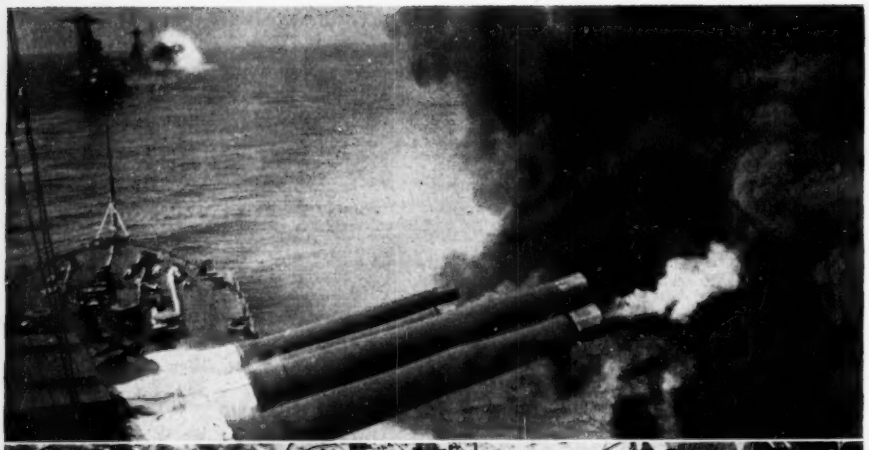
Those two battle victories of the Royal Navy in the Atlantic were far more significant than a fine proof of superior seamanship and fortitude. If those two ships, the *Graf Spee* and the *Bismarck,* and their sisters, had been able to roam at large on the high seas no convoys could have got through, no troops could have been brought into the Mediterranean and no supplies could have been brought to the Allied troops.

The "Prince of Wales and the "Repulse"

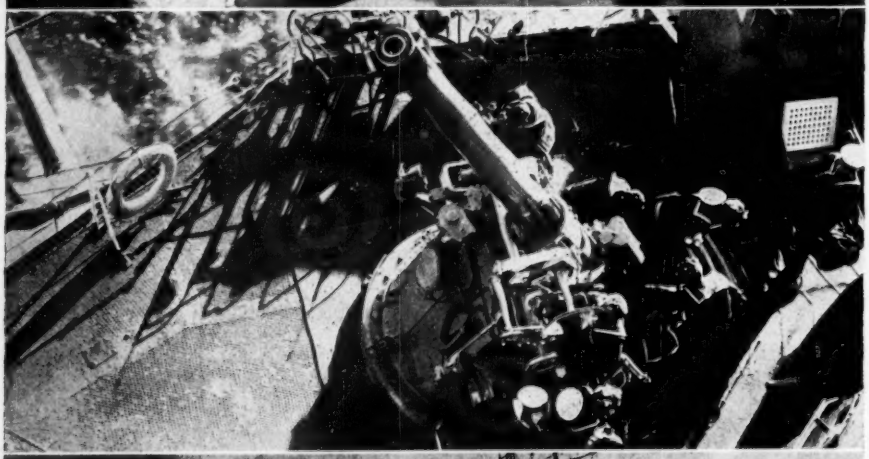
The *Bismarck* was sunk in May, 1941, but seven months later a blow was struck at the Royal Navy from which Allied sea power took many months to recover. Japan's treacherous attack by air on the United States Navy at Pearl Harbor instantly raised the threat of the Japanese "fleet-in-being." The only way to counter that threat was to move the big ships of the Royal Navy into the vicinity of the Japanese Navy. But ever since the fall of France and Italy's declaration of war, an enormous task had been imposed on the British Navy in the Mediterranean. With the Italian "fleet-in-being" and the danger of the seizure of the French Fleet by Germany the British Navy could not afford to move forces into the Indian Ocean as a check to the advancing Japanese forces. Nevertheless the additional task had to be attempted. The result of that desperate effort was the loss of H.M.S. *Prince of Wales* and H.M.S. *Repulse,* two of the biggest ships of the Royal Navy, in the South China Sea in December, 1941. Both were sunk at the same time by Japanese torpedo bombers; and the immediate effect of this heavy blow was the Allied loss of the command of the seas in the East Indies. The armed forces ashore were unable to resist for long without command of the sea, with the inevitable result two months later of the fall of Singapore, Britain's strongest and most important naval base in the East. The command of those Eastern seas was now in Japanese hands, and their armies with supplies pouring in down the Pacific shores swarmed on through the jungles and swamps of the Philippines and through Burma to the frontiers of India.

But the Japanese aggression, on the other hand, brought into being the threat of the United States "fleet-in-being" and it was not long before the United States Navy assisted by units of the British Fleet was able to penetrate again into the Japanese controlled seas. The Axis had widened the war. They had extended it into all the seas of the world and stretched the communications of the Allies to the limit. But although before Pearl Harbor and especially after the loss of the *Repulse* and *Prince of Wales* there was a definite limit to the work that the British Navy could do, the immediate effect of Pearl Harbor was the instant mobilization of the whole of the United

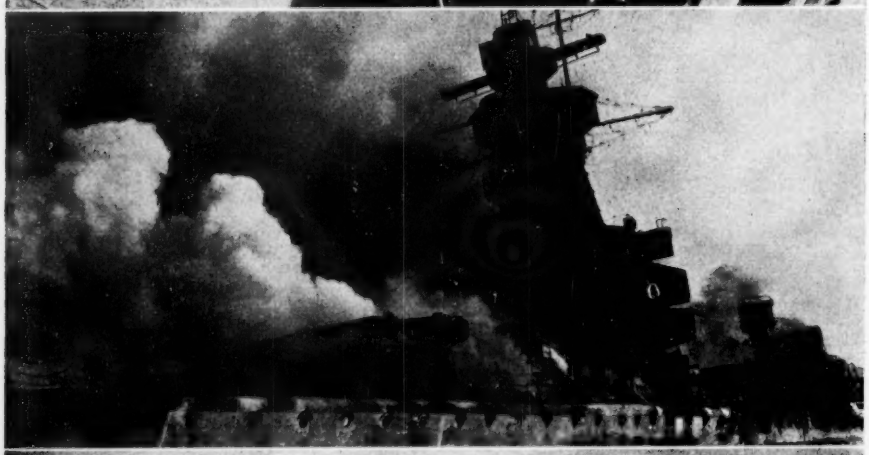




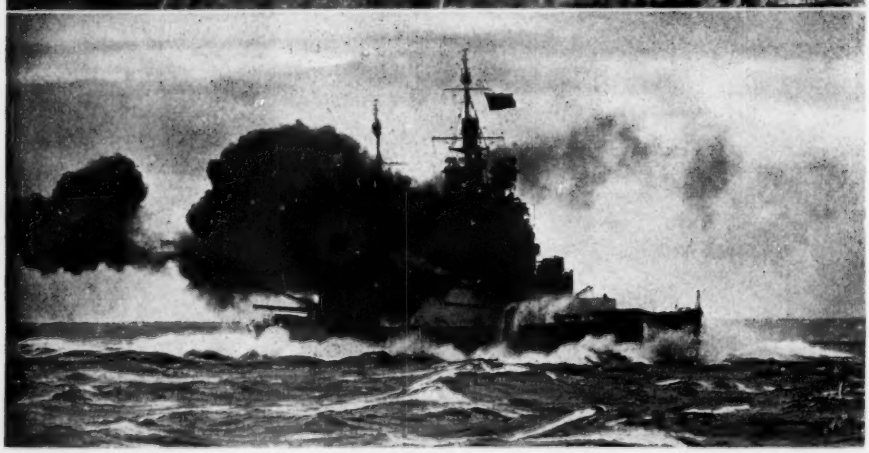
The fifteen inch guns of H.M.S. **Valiant** firing a broadside. In the background is H.M.S. **Barham.** These two battleship helped destroy three Italian cruisers at Matapan.



A ship's anti-aircraft gun, part of the heavy armament against air attack. Supplementary armament is provided by multiple pom-poms grouped and set up in various parts of ship.



The **Admiral Graf Spee** in flames off Montevideo. She was scuttled after being severely damaged by the cruisers **Exeter, Aiax,** and **Achilles** in the Battle of the River Plate.



The H.M.S. **Duke of York** firing her guns as she plows through the sea. These guns played an important part in the sinking of the German battleship **Scharnhorst** in 1943.

States Navy at sea in the Pacific. Within a few weeks the United States Navy was in action and putting to the proof the principle of the "fleet-in-being." The disposition of the United States "fleet-in-being," transformed overnight into a fleet-in-action, has bottled up the Japanese Fleet within the limits of the seas which the Japanese forces have conquered on their own.

The big guns of a battleship are designed primarily for the purpose of silencing the big guns of other battleships. The bigger the gun the bigger the ship. Big ships have very seldom been called upon to do more than battle with other big ships and aircraft, and it is only rarely that they can find the opportunity to come close enough in shore to effect a coastal bombardment with their heavy guns. There is the ever-present threat of shorebased aircraft above them which keeps them away from enemy coasts.

The Sicilian Campaign

But in the Sicilian campaign the big ships of the British Navy found themselves in the unique position of attacking the enemy's armies with devastating fire from a floating base and with a swiftly changing range of ten to twenty miles. In leap-frog maneuvers British ships cleared the way for Allied armies advancing up the coast.

The immensely important part that the battleships, cruisers and even the destroyers of the Royal Navy are doing in support of the British and American armies in Italy is a form of naval strategy that has never before been attempted in history. Its amazing success has been admitted even by the German High Command. It is more than coastal support; it is a new form of direct attack upon the enemy's military gun emplacements ahead of the Allied armies, and on the supply lines astern of the enemy.

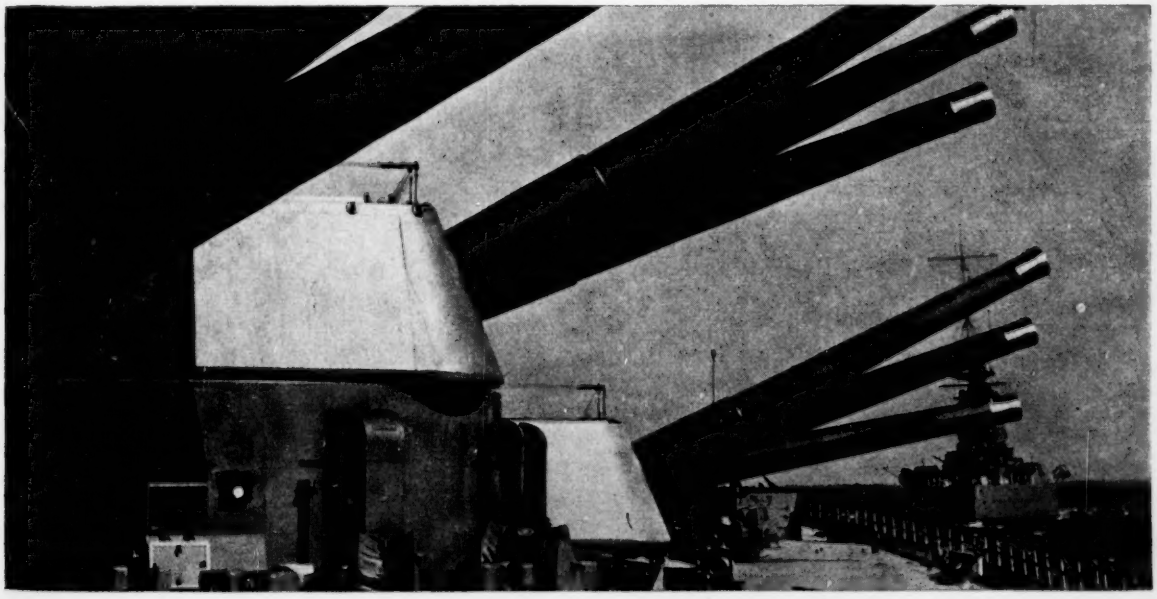
Sea-Air Power

The Germans believed, and emphasized their belief in radio broadcasts, that the sea power of Britain could be nullified by air power: he sought another means to destroy it—a land-based striking air force which he believed could reach, assail and disperse the flotillas of the Royal Navy. The Battle of Britain, however, proved that the British airpower itself was superior to German airpower; and it soon became apparent that sea-and-air power was as superior to land-and-air power as sea power had always proved to be to land power.

Air power consists, of course, of a landbased striking force capable of crossing the sea. In the case of Crete, this force was used successfully—though at murderous cost to the German invaders. But the extension of such attacks becomes progressively more difficult because the bases from which the aircraft take off cannot be advanced indefinitely. In the case of air attack on ships at sea, the difficulty is greater still. Ships are able to establish their bases, for long periods at least, outside the operational range of shore-based aircraft in the heart of the ocean space, and they do *not* remain in the same positions.

Thus it is that the sea bases of air power, which oceangoing warships represent, can remain comparatively safe from attack by land-based air power.

There is one big disadvantage, however, to which land-based aircraft can subject sea power.



The massive turrets and guns of H.M.S. **Rodney.** In the background, H.M.S. **Nelson.**

Flat tops take bombers and fighters into action far beyond range of land-based aircraft.

It can force ships away from enemy-held coasts and ports and compel them to operate at long distances. The loss of the *Prince of Wales* and the *Repulse* is an example of the dangers of ships operating within range of shorebased enemy aircraft without air protection: so are the losses suffered by the Japanese from Allied shore-based aircraft at the battles of Midway Island and the Coral Sea.

On the other hand, sea power operating from its comparatively secure seabases can launch devastating air power both in attack and defense. Secure operational bases are, in fact, a vital necessity for effective air power, and sea power can establish those bases. The sea-air power thus established makes it possible for naval units to operate near the shore under the protection of aircraft based far out at sea. These sea-air power engagements have been a notable example of engagements in the Pacific, and even more startling were the successes gained by British sea-air power in the Mediterranean, during the German mass air attacks on the convoys to Malta. On one occasion, 150 German dive bombers, shore-based within a few miles distance, attacked a British aircraft carrier for seven continuous hours. Of these bombers, fifty were destroyed in the air and forty by British bombing attacks at their base. The aircraft carrier made harbor safely. The convoy was unharmed and although a British cruiser was lost, approximately $4,000,000 worth of German aircraft perished in exchange. This is a good example of the power of seaborne aircraft fire and fighter-bomber protection to guard a naval floating base. Such a base, situated in ocean space from which her aircraft could find their targets ashore could not be spotted by aircraft retaliating from a shore base.

There have been a large number of air attacks on Allied ships, but they have given small return in sinkings: and it seems clear that the airborne torpedo is far more effective than the bomb as an air weapon against ships. The torpedo-carrying planes of the Royal Navy's Air Arm, for instance, flying very low, attacked the Italian battle fleet at Taranto and severely damaged two battleships, two cruisers and a destroyer. Others were put out of action by torpedo-carrying planes in the Battle of Calabria.

The answer to Hitler's land-air power, then, seems to be clear. It is sea-air power; and this power is already held and is fast growing, in

Allied hands. What has been conclusively proved in the present war is that air power adds immensely more to the force of sea power than it takes from it.

Below the Surface

German submarine attacks upon British shipping in the war of 1914-1918 at one stage brought Britain to within six weeks of the end of her food supplies. It was called "unrestricted" submarine warfare because it aimed to sink shipping of any nationality on the assumption that British sea power made it certain that while any shipping might be of help to Britain it would not be allowed to help Germany. The convoy system broke that threat to Allied supply. In the present war the Germans calculated, with some reason, that full-scale submarine warfare would achieve a complete blockade of Britain. For this submarine warfare was aided by air reconnaissance and by air attack on merchantmen in convoy as they neared their ports and came within reach of German aircraft bases. It was an attack on the sea routes from their starting point on the United States seaboard, across the whole field of the North Atlantic Ocean and on the narrow waters of the European coast. It was calculated seriously to impair British sea power.

That attack has failed. The detailed reasons why it has failed, however, are something which the enemy would dearly like to know. Only some of the elements which caused its failure can be given here.

Once again the new factor of air power in relation to sea power has added more to the side of sea power; though it may be asked why air power should help *defense* against submarine more than submarine *attack,* and why it helps defense against near-shore air attack more than it helps the attack itself. This appears to be a reversal of the facts as they generally apply to air versus naval power.

The reason is that a submarine is a warship with a low surface speed and an even lower below-water speed. She is extremely vulnerable to attack both by bomb and depth charge (a depth charge is a powerful under-water explosive which sets up intolerable water-pressures, causing the plates to spring open). She has not the speed to escape when located by aircraft, destroyers or corvettes (which are a new type of anti-submarine escort vessel). A submarine's offensive power lies in the secrecy shrouding her approach and this capacity for hiding is her best defense. Once her attack is launched, her existence is no longer hidden. This is why submarines hunt in packs for they can then score heavier sinkings and have greater chances of escape. And in order to congregate the packs it is necessary to have long-range, shore-based aircraft available to spot

A U-boat in the Bay of Biscay, peppered by machine guns of a Sunderland flying boat.

the convoys, communicate with the submarines by radio and collect them together for attack against the fleets of merchantmen. For submarines themselves have only a limited visibility on the surface and, of course, a severely limited visibility when submerged.

But long-range air patrols from the shores of Britain, Canada and the United States, Greenland and Iceland are as well able as the Nazi airmen to reconnoiter the ocean space—and they have the advantage of knowing in advance what is the route of the convoy. They can concentrate their flying hours into a hunt for enemy submarines, while Nazi aircraft must search every quarter of the ocean in order to locate the convoys.

Then convoys can bring air power into action themselves. On the forecastle of merchant ships, fighter aircraft can be accommodated and can be catapulted aloft to attack enemy reconnaissance planes. If the reconnaissance plane is despatched in daylight, an entire submarine pack is deprived of its "intelligence," for submarines dare only surface at night to get into touch with the "spotting" aircraft which alone can enable them to intercept convoys.

The submarine is the only really formidable weapon which Germany has massed upon the high seas. But since their offensive power lies in their secrecy they cannot escape from the fast-moving destroyers and corvettes which accompany the convoys. Even when they are driven below the surface and their speed is reduced still further the destroyers nose around like hounds sniffing the ground, their asdic gear sounding the depths. As they get the scent, the destroyers release their depth charges: wreckage, oil and, maybe, a body or two bubble up to the surface and

the hunt is over. The destroyers hover around to make sure that the prey is dead—for U-boats have a trick of discharging oil and debris, even bodies, to give that impression—then they return to the convoy.

No ship of any size can ever be completely immune from U-boat attack while she is on the high seas. But before a pack of U-boats can launch an attack on a convoy it must be prepared to defend itself against very formidable methods of attack by the Allies: the bombing of its bases and repair yards in Germany and German-occupied ports; the bombing of its boats as it puts out to sea and as it returns; attack by Allied surface forces at sea; attack from convoy protection ships; the disclosure of its position by reconnaissance planes, and bomb-cum-depth-charge attacks from aircraft.

To add to this, there is a continual wearing down of the strength of the submarine force by the bombing of its bases, docks and building yards; the blockade of submarine exits by mine and bomb and the systematic plastering of airfields and their lines of communication.

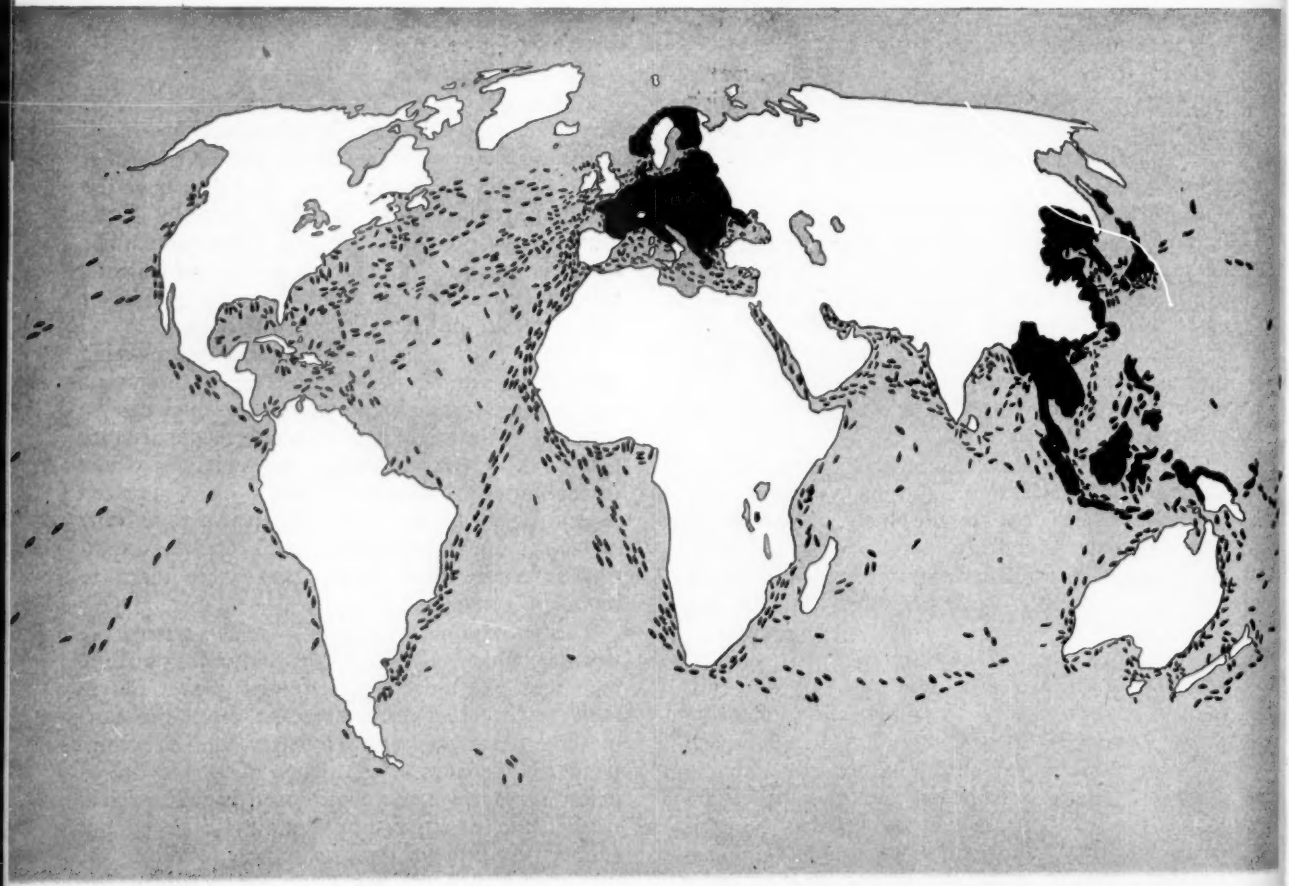
These facts will give some indication of why the submarine menace has failed against Allied sea power.

United Nations' Sea Power

To sum up: the control over sea communications which the United Nations hold through their sea power gives them an increasing initiative in the global war, since it allows them to draw on world resources for waging the war, maintaining their populations and their war production at home, and denies these resources to the enemy.

The only effective resistance to seapower's offensive is that derived from air attack, submarine attack or surface attack. But Allied sea power's use of air power and the ability it has to give both air power and land power a maximum striking force overcomes such resistance.

The struggle is hard and may well be long; heavy losses will be incurred and inflicted. But the sea power which is vital to victory is possessed by the United Nations and the added power which air power gives in combination with sea power must be irresistible in the long run. The stake is freedom for all, and the freedom of the seas is the first necessity for that freedom. **END**



Homolographic map showing relation of earth's land masses. The sea joins, not separates, them. Small black symbols represent all British ships at sea on a typical day during peacetime.

Learn and Live

Practical suggestions on how Marines can do a better job more safely in the field: a new and handier means for carrying ammunition; how to improve on the straddle trench through use of empty steel oil drums. *By Lt. Col. T. M. Mason, USMC*

Handy Ammunition Box

Have you ever watched an ammunition bearer in a machine gun platoon stumbling along through the jungle, a box of ammunition in each hand, pack on his back, rifle over his shoulder, and wondered what would happen if someone shot at him? There's only one thing the man could do if he had to engage in a fire fight—drop his ammunition boxes, unsling his rifle, and take cover all at once. After the fight the chances are great that he will never find the two small ammunition boxes he hurriedly dropped in the bush. If he did find them he might discover that in his excitement he had broken the carrying straps. The straps do break without much trouble, and material for repairing them is not usually available in the field.

We solved this problem with some ration cases and knapsacks of The Pack M1941. Using the thicker pieces for the ends and the thin pieces for the sides, a light weight wooden box was made that would hold a loaded 250 round machine gun belt and still fit in the knapsack. A cover was not attached as the box was always carried in the knapsack and the knapsack flap kept the weather out. Lightweight metal was tried for the box but it proved unsatisfactory. The metal was easily jammed under field conditions, making removal of the belt difficult. The wooden arrangement gave a lighter load than the metal, and sturdy carrying straps were provided.

The biggest advantage of this arrangement is this: by taking two knapsacks and fastening the coupling strap of one to the coupling strap buckle of the other, and vice versa, you have an arrangement similar to a mortar ammunition bag, with only the two coupling straps going over the shoulders. This gives you great freedom of movement in throwing off the knapsack in case of a fire fight. Should you do this, you have a larger bundle to locate afterwards when both boxes of ammunition are fastened together.

With this method of carrying ammunition, moreover, the bearer can carry his rifle in his hands where he can quickly disperse any harassing enemy, possibly even without having to ground his load. Carrying one belt of ammunition in front of the body and one belt in back gives an evenly balanced load. The straps are free, and long enough to allow individuals to adjust the load to their own requirements. A piece of line or strip of canvas with slits in it proves helpful in keeping the coupling straps from slipping off the shoulder. Further, this arrangement lends itself to lowering ammunition loads into small boats by line from the deck of a transport.

By freeing the ammunition bearer's hands we not only place his rifle in a position of readiness, but also allow him to move easily, maintain his balance, and fend off brush and branches that impede and cause discomfort to his movements. This is a very big advantage for movement at night. As long as one regulation ammunition box is carried by each gun squad, the loading and feeding is standard, although practically the same results can be obtained without use of standard ammunition boxes.

Improving The Head

The straddle trench probably originated with the first thoughts of field sanitation, and it is still used today with practically no improvement. The trained soldier is conscious of the necessity of covering human waste and the open straddle trench has been the accepted solution for generations. This has not been an ideal solution. Some users are careless in covering completely their spoil. If too thin a layer of dirt is spread as a cover, the flies are able to penetrate it. Often the necessity of covering the soiled toilet paper is overlooked completely. Then too, the problem of the careless user who allows his liquid stool to spoil the sides of the saddle trench and whose diarrhea pains have removed all his considerations of field sanitation presents a serious menace. Even if he tried, it would be difficult to properly clean the soiled side of a straddle trench.

The incorporation of mechanized equipment in the assault or front line units has made available many empty steel oil drums. Here is an ideal solution to the field head problem. It is a simple matter to knock one end out of an oil drum and bury it three quarters deep in the ground with open end down. Now by making a smaller hole in the top, you have a simple one seat head which is very easily fly-proofed by making a tight fitting cover for the seat itself. Several can be constructed in a short time, and without much more effort than that required to dig straddle trenches. The oil drum head is a vast improvement from the sanitary angle and with a little care in construction, it can even be made comfortable. **END**

Supply Pipe Line

Unimpeded flow of military supplies from factory to fighting front is a responsibility of user and forwarder as well as producer. Leaks along the line may deprive a fighter of equipment he needs.

By Brig. Gen. Leonard E. Rea, USMC

THE term "Pipe Line" has been applied to the logistical problems connected with the war effort. We generally picture a pipe line as a supply system used to carry a commodity from a given source to a distant place for distribution. The Supply Pipe Line is considerably more complicated. Instead of being a distribution system for one item, such as water, gas, or oil, it carries thousands of items procured from countless sources.

The requirements of the soldier on the battle front and in the training centers determine the supplies and equipment which must be provided to enable him to meet and overcome his opponent successfully. The procurement of these items is rather involved as it must start back at the source of raw materials.

At present the United States is the main source of the Allies not only for raw materials but for the finished products as well. Because of the vast demands of our forces and those of our Allies, it is necessary to allocate our limited stocks of raw materials to the various services and to industry for the manufacture of countless end products. To accomplish this, estimates must be prepared far ahead of the time the end products are actually required in order that the Allocations Board may determine just how much of the available materials to allocate to each requirement. As the demand is always much greater than the quantities available, it can readily be seen that after allocations based on the estimated requirements for the coming year have been made, and the materials turned over to the manufacturer, there is practically nothing left of that year's output of raw materials. There is a constant effort being made by industry and the Research and Development Boards of the services to develop new materials or find substitutes, but all this takes time and often, when it is thought that a suitable article has been found, it does not meet the requirements in all localities and under variable climatic conditions.

Controlling the Flow of Supplies

After material has been allocated, contracts must be made with various manufacturers to produce the end products. Such contracts usually call for deliveries spread out over a considerable period to relieve the contractor, as well as the Quartermaster, of the necessity of maintaining large storage facilities. Yet, deliveries must flow fast enough to meet the demand of the troops and to keep the pipe line filled. Industry has done, and is doing, a tremendous job, although it has had to contend with many set-backs such as shortage of material and tools, lack of manpower, and changes in specifications due to new developments.

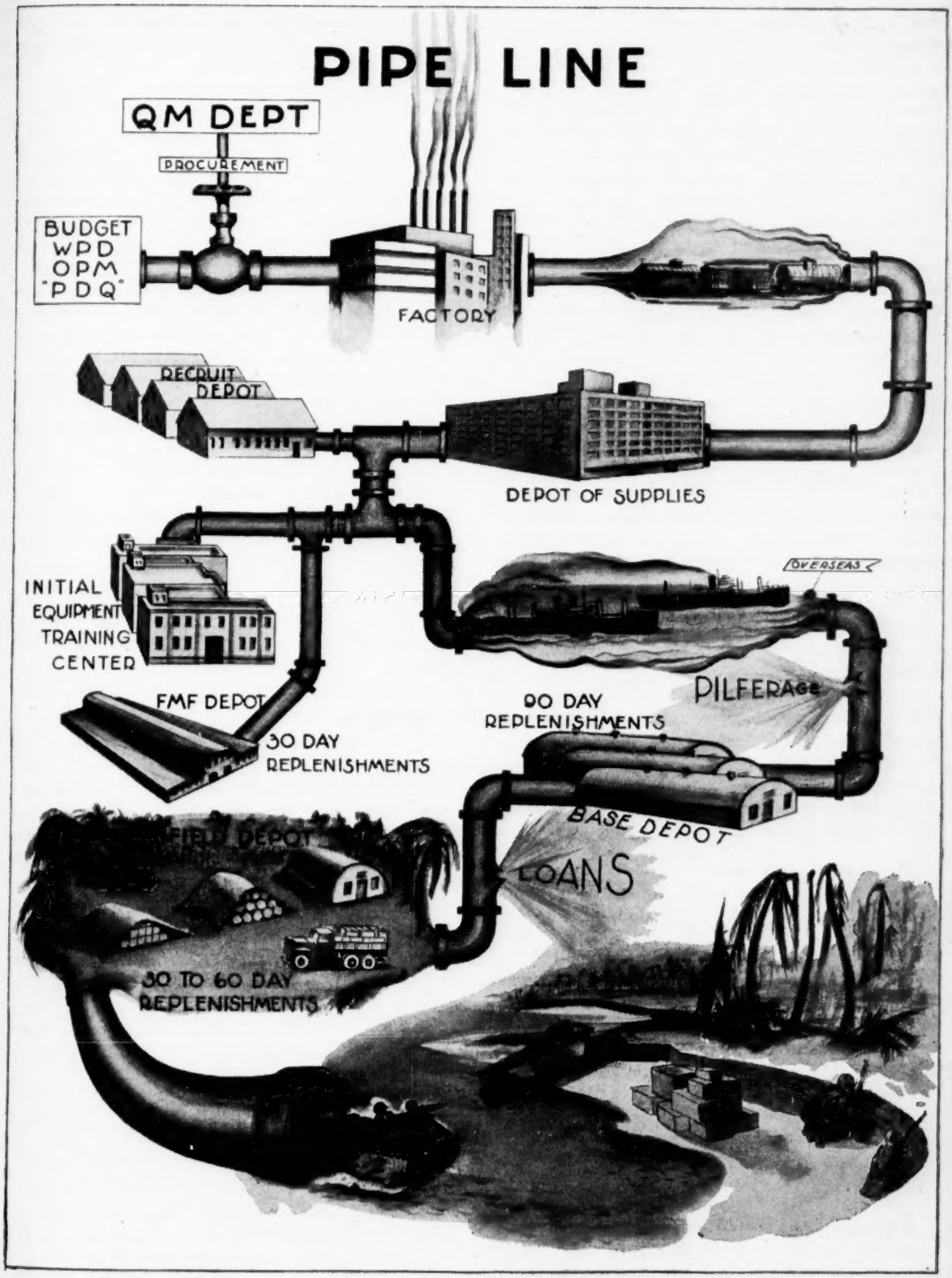
From the factories the goods flow into the various supply depots where they are sorted, sized, and marked, and then used to meet the requisitions submitted by the using organizations. Deliveries into the supply depots have been scheduled to meet contemplated requirements based on the Tables of Basic Allowances and to keep the line filled all the way to the using organization.

Moving the Goods Into Combat

From the main supply depots the pipe line runs to the various depots at the training centers and embarkation ports, as well as to the various posts and stations within the continental limits of the United States. At the training centers newly activated units are equipped with their initial requirements and the authorized replenishments which will accompany them upon their departure for overseas duty. From the depots at the embarkation ports are shipped all supplies and equipment for the combat units.

The pipe line continues to the theater of operations through the base and field depots established throughout the combat area. These depots requisition for the organizations which they serve in their particular area. Their requisitions are submitted to the supply depots in the United States, the requisitions being screened through the Supply Service of the Pacific Area which coordinates logistic details and controls all the depots in that area. The line continues from these forward depots right down to the front line where the supplies finally reach the organization and individual who will put them to use. The supplies furnished these organizations are in accordance with the allowances established in the Tables of Basic Allowances or, where it is found these Tables are inadequate, as required, and based upon actual expenditures. The data compiled from these expenditure reports is used as a basis for determining the correct allowances which should be set up in the Tables of Allowances.

Just like any other pipe line there are many factors which tend to overtax the line, such as ex-



A diagram worked out by General Rea shows the intricate "pipe line" through which military supplies must flow. From its source in paper work, it passes through centers of production, through the depot of supplies, to posts within the U. S. or to the docks. Equipment arriving abroad passes through base and field depots before reaching the front.

cessive losses, pilferage, carelessness in caring for equipment, abandonment of equipment, and gifts or loans to other services. One of the largest leaks in the supply pipe line at present is pilferage. The thoughtless fellow along the line taps it to obtain something he thinks he may need, forgetting that the life of the fighting man at the end of the line, or even the success of an operation may depend on those supplies reaching their proper destination. Another large leak, or possibly it should be called a waste, is caused by the using organizations themselves. Naturally, men are physically exhausted after an engagement with the enemy, especially in the jungle localities in which our operations are now conducted, and in their hurry to get out of the forward areas, it is quite natural that they agree to turn over supplies and equipment to the forces relieving them. If there were an inexhaustible source of supply, and if there were no complicated shipping problems involved, such procedures might be most agreeable; however, as has been pointed out, there is a bottom to the barrel. It takes time and material to refill the pipe line and if the equipment is discarded by the organization, then that unit is not prepared to engage in combat again, and must wait until suitable arrangements have been made to borrow the equipment from another service or until new equipment is produced. This, of course, drains the reserve which has been built up in the pipe line.

The whole country is giving up many desired items and practically every adult member of all households is engaged in some kind of war work, struggling to produce the equipment needed to get the job done. They are using every ounce of material which is available or which can be produced. It is up to the using organizations to appreciate these things and to hold on to every item of equipment as long as it is usable or capable of being repaired.

The success of all our operations is dependent on the uninterrupted flow of supplies through the pipe line. The pressure in the line can only be maintained if there is a plentiful source of supply. That is, of course, limited to natural resources and the capabilities of industry. It is vitally essential that every individual and each organization conserve every item of supplies and equipment furnished.

Gags For The Foxhole

Our fighting man likes his humor aimed straight at him. He can take it. The more the joke's on him the better he likes it.

On that sub-zero hellhole of Attu I asked one of the guys on beach patrol if he had to walk very much and he said, "I don't know, but when I enlisted I had feet."

Halfway around the globe and across the Equator I found the same bunch of kids. In blazing Africa a gag like this was sure-fire: "It's so hot around here I took one look at a pup tent and it was panting." Or, "These boys are really tough. They don't bother manicuring their fingernails. They just stick their hands under a rock and let the cobras bite off the cuticle." And they like this: "It's so hot around here that even the scorpions take salt tablets."

They can have a dozen days' growth of beard and few hours of sleep and have just passed through the gates of hell, but they'll still laugh. They'll even laugh at gags about the chow line—gags like this: "I won't say it's tough waiting in that chow line, but they've got a guy riding up and down on a bicycle offering plasma."

And our bluejackets like humor slanted their way. Every time we play a naval base or unit we make sure to poke some good-humor fun at them. Here are a couple of samples: "You know what a sailor is—that's a wolf in ship's clothing." And, "You know what a Navy uniform is—that's a girdle with legs."

The Waves will roar at something like this: "Every girl here is trained to replace a man. The one I was out with last night must have been trained to replace Boris Karloff." Or, "You know what a Wave is—that's a sailor with a flirtation walk."

Take a weary bunch of Marines sweating in fatigue suits and they'll laugh at this: "These fellows spend most of their time in fatigue suits—a fatigue suit is a foxhole with buttons."

At an officers' candidate school they'll go for: "You know what an officer candidate's school is—it's a concentration camp on our side."

The most wonderful thing of all about our boys' sense of humor is that it doesn't change when the chips are down.—Bob Hope in *The New York Times Magazine,* May 28, 1944.

Jap Agents Busy Again

A former correspondent in China for the New York TIMES detects resumption of activities by Japanese operatives and propagandists, and criticizes Americans who would deal leniently with them. *By Hallett Abend*

UNIDENTIFIED Japanese agents are once more working busily in the United States, originating and assiduously spreading ideas and slogans designed to weaken our national will toward an all-out victory against Japan. These crafty fellows, and of course few of them are Japanese, are adept at coining phrases and framing arguments which appeal to our old prejudices, and when unthinking Americans repeat these phrases they are unknowingly playing Japan's game, which is to avoid total defeat, above all to avoid complete disarmament, so that the Empire may be able to prepare to attack us again within the next twenty years.

During a recent two-month trip from New England to Southern California, a trip which covered the Middle West from Kentucky on the south to northern Wisconsin and Minnesota, I was appalled to hear at every stop arguments like this:—

"After Hitler is defeated we should bring our boys home. Why should we fight on against Japan? Of course we must free the Philippines, but after that we should just send China all the military supplies she needs, and lend her money, and let China defeat Japan on her own time. After all, this Oriental dog fight has been going on almost continuously since 1931, and fundamentally we have no business in the Far East."

That's a dangerous line of talk, but the following is still more dangerous, because it appeals to some of our ancient and deep-seated prejudices. It goes like this:—

"Why should a million American boys be killed and wounded in the Far Pacific just to rake the British and Dutch colonial chestnuts out of the fire? Let's just drive the Japanese out of the Philippines, avenge Bataan, and then bring the boys home for keeps. If Britian wants Singapore, and if Holland wants Java back again, let 'em fight for their own former possessions."

This Is Our War

When Americans repeat arguments of this kind their action shows that they do not realize that we are in this war primarily to rake our own chestnuts out of the fire—not those of the British and the Dutch. We are fighting to bring about the complete defeat and utter disarmament of Japan, because only by accomplishing these joint ends can we make Japan a nation with which we can live with assurance of peace and security.

If we do not bring Japan to unconditional surrender, then we ourselves will have to turn this nation into an armed camp, and be constantly prepared to fend off another attack from the Orient. And if that attack comes twenty years from now, the improvement of the airplane in the intervening two decades will probably make it possible for our foe to achieve thirty or forty equivalents to Pearl Harbor on the first day of the next war, instead of only the one disastrous blow delivered against us on December 7th, 1941.

Their Lines Are Diverse and Insidious

Another evidence of the prevalence of successful Japanese propaganda in this country is the widely expressed doubt concerning the ultimate wisdom of the decisions announced after the Cairo Conferences of President Roosevelt, Premier Churchill and General Chiang Kai-shek. Those decisions were to the effect that Japan is to be deprived of all the conquests she has made during the last half century, and that, specifically, Formosa and Manchuria are to be returned to China, and that Korea is to have complete independence "in due time." There was no mention of the future of the southern half of the Sakhalin Island, which Japan took from Russia after the war of 1904-05, and presumably this was a deliberate omission, since Russia and Japan are not at war.

More disturbing, there was no mention of the Marshalls, the Carolines, and other former German islands which Japan received under mandate from the League of Nations after the first World War. These islands, being reconquered exclusively by American forces, should hereafter belong to the United States. This would not be a revival of colonial imperialism by this country, for the islands have a native population of less than 100,000. They import almost nothing, and their exports are insignificant—a little copra, a little dried fish, some pearls and pearl shell. But they are of vital strategic importance, would always afford us access to the Philippines and to China, and will be essential to our commercial airlines in the time of peace.

The arguments which paid Japanese agents are using against the Cairo Conference decisions are the same old lying arguments they used for many decades—arguments which resulted in the American government silently condoning past Japanese territorial conquests. Tokyo's propaganda hire-

Photo by Hal Bergman

Hallett Abend at his home in Vermont. He was once assaulted in his Hangkow apartment by armed Japs looking for "anti-Japanese writings," and "insulting telegrams."

lings in this country are blandly dusting off and trotting out the old fiction that Japan, because of her small home area and large population, must have colonies or else "population pressure will cause Japan to explode in our faces."

Well, we permitted Japan to filch Formosa away from Chima. We permitted her to annex Korea, although her government repeatedly assured us she had no such intention. We permitted her to establish a puppet ruler in Manchuria. And in spite of these expansions, or rather as a result of the power and resources which they brought to her, she "exploded in our faces" anyway.

Japan never used newly-conquered lands as outlets for her overcrowded population. Between 1895, when she took Formosa, and the date of Pearl Harbor, the native population of that island increased by nearly 3,000,000, but less than 300,000 Japanese civilians ever settled there. Between 1910, when she annexed Korea, and December, 1941, the population of Korea increased by 13,000,000, but only 250,000 Japanese civilians took up permanent abode in Korea. Japan's attempts at fostering a great migration to Manchuria, lavishly financed for more than a decade, were also utter failures.

The Chorus for a "Merciful Peace"

All that Japan needs in order to prosper is access to world markets and access to raw materials which she lacks in her home islands. Japan can and will thrive as a maritime nation and as a great manufacturing nation, if she enjoys these privileges. The notion that her people will starve if they are forced to hand back the territories they have stolen from their neighbors is a notion that has been planted amongst us by hirelings of the imperial government at Tokyo.

Forseeing Japan's defeat, which is now inevitable unless we become war weary or soft-hearted and soft-headed and consent to a compromise settlement, pro-Japanese propagandists are already joining the chorus of pro-German workers who are taking up the slogan that we must conclude a "merciful peace" and not a punitive settlement. In particular these gentry are appealing to the innate American sense of fairness and humanitarianism by urging that we "must not starve" Japan and Germany after the war, but must have freighters loaded to capacity with nourishing food all ready to sail for Yokohama and Kobe, Hamburg and Bremen, as soon as fighting stops.

Dictates Common Sense

These propagandists are keenly aware of the fact that a genuine world food shortage is inevitable, and that present prospects are that many millions of friendly peoples in lands newly liberated from German and Japanese aggression must not only suffer from malnutrition but must actually die of hunger.

The decencies that the United Nations are fighting to uphold and preserve will not permit us to starve our defeated foes, but common sense and a proper regard for the welfare of our friends and allies should automatically bar out any policy of fattening up the Germans and the Japanese so long as there are acute needs for foods in other lands.

The peacemakers should sternly keep in mind that the German and the Japanese people, for years before the second World War was started, voluntarily and even joyously gave up butter in order to amass great reserves of guns—guns which they turned against us in the hope of accomplishing our defeat and destruction. If there is the expected shortage of foodstuffs in the world when hostilities cease, the peoples of the defeated aggressor nations can have no just cause for complaint if they are kept on the same rationed basis which they voluntarily adopted in order to arm themselves to attack us—and if this rationing period is maintained for the same number of years after the war ends as it existed before the war was begun, the stern lesson might deter them from reviving dreams of world domination.

Dangers of Softness

There is no danger of the United States fostering or participating in a harsh or a vengeful peace settlement. The real danger is that our proverbial "softness" may result in the kind of forgiving peace that would make another global conflict not only possible but even probable within the next twenty or twenty-five years. Evidences of this softness are multiplying even now, although the war is not yet half won. We are forgiving and freeing from prisons and internment camps people who have been convicted of acting as enemy agents, and this is a shockingly dangerous practice.

Take the celebrated case of the Rev. Yutaka Minakuchi. This Japanese, then not yet twenty years of age, came to this country in 1897—forty-one years before Pearl Harbor. He attended five different American universities, obtained degrees, and became an ordained minister—a minister not for Japanese but for white Americans. He never went back to Japan, except briefly in 1938.

Minakuchi had a church in Illinois for years. He married a girl in Kentucky, who bore him a son, and later died. He preached for years in Kentucky. Then he was a Chatauqua lecturer. In 1927 he obtained a church at Peacham, Vermont, and married a Vermont woman, who bore him two daughters. A few years later he transferred to another church in Vermont, in the little town of Glover.

Finally the FBI caught up with him, and arrested him on documentary evidence showing that for many years he had been receiving $250.00 a month from the Japanese Consul General in New York City—money paid, so said the receipts, "for propaganda service."

Minakuchi was sentenced to imprisonment at Fort Meyer "for the duration," and to deportation to Japan after the end of the war. So far, so good. Then a group of men and women, instead of devoting their time and energy to forwarding War Bond, Red Cross or USO campaigns, and instead of spending their money for War Savings Stamps, began to spend both time and money agitating for Minakuchi's release. This convicted Japanese agent is free today, back at his home in Vermont!

The same sort of activity was going on in this country at the very time that American and Filipino soldiers who surrendered at Bataan were undergoing the agonies of the "March of Death" to their filthy internment camps. The same sort of activity is going on today, participated in by Americans whose soft hearts forget the thousands of American men, women and children still undergoing starvation, mistreatment and shocking indignities in internment camps in Japan, in China, in the Philippines and elsewhere in the Orient.

If our dead on the beaches at Tarawa and in the Marshall Islands, and those in the jungles of the Solomons and New Guinea, could regain their voices they would cry out against a softness which will make harder the winning of this war, and which may well make a repetition of this conflict inevitable.

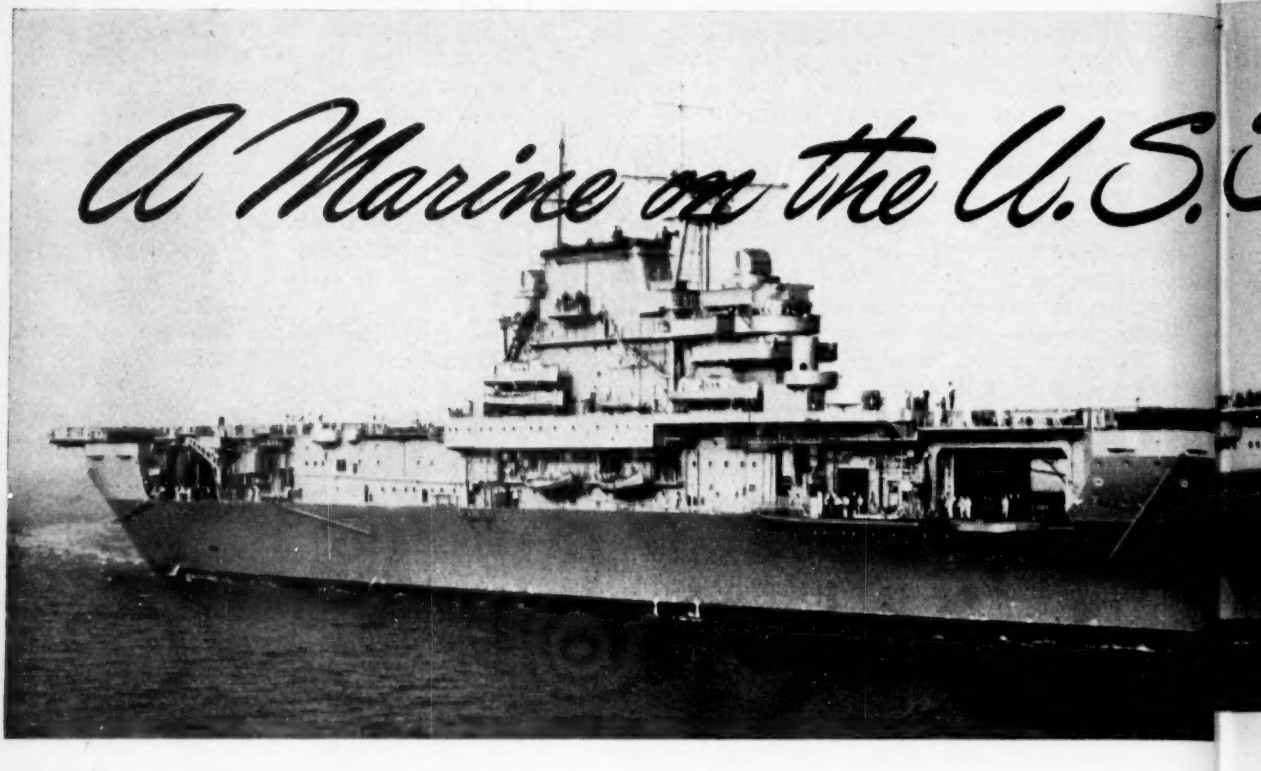
No Hands

There is somewhere on record, even if only in memory, a story of the last war and of how a pilot and his gunner-observer, flying one of those crazy antiquated orange crates, decided it would be safer, as well as more amusing, if each decided to learn the other's job. Accordingly the pilot learned to shoot, and the gunner learned to fly. There is no evidence that this reciprocal arrangement did not work admirably until one day, after a more than usually odd landing, the gunner accused the pilot of not knowing how to fly.

"That was a hell of a landing!" he said.

"Good God" the pilot replied, "I thought *you* were landing her."—From *Aircrew*.

A Marine on the U.S.S.



The brief but illustrious history of the carrier that launched our first bombers against the Japanese homeland, as seen through the eyes of a proud survivor. Though she was blasted and now rests on the floor of the Pacific, she left a challenging record for a new and more powerful successor to match. ***By Tech. Sgt. Angus T. Gillis, USMC, as told to Lt. Col. H.S. Mazet, USMCR***

ONE day in late Fall, 1941, we stood in a huddled group in Norfolk, and gazed at a great, gray hulk towering over the ways and docks. Despite her lack of guns and planes, her trim lines, the graceful sweep of her prow, her well-shaped stern and the overhanging catwalks of the flight deck indelibly stamped her as a beautiful carrier. She seemed powerful as she rested, awaiting her crew and commissioning, and none of us said anything as we looked in admiration at the *USS Hornet,* might flat-top of a mighty fleet.

The day our new home was commissioned, the Assistant Secretary of the Navy, his wife, and other high dignitaries came aboard and made speeches on the flight deck. The *Hornet* was two hours late berthing at the Naval Air Station, and we were pressed for time, already working down below decks in the galley. Those speeches which faded on the wind topside reached us very indistinctly via loud-speaker. Before we quite realized it, the ship received her pennant, the dignitaries left and we, the crew, started to make a brand new ship ready for her maiden voyage.

Two weeks after she was commissioned, we sailed for our shake-down to the southern tip of Florida and up into the warm Gulf. There we participated for the first time in maneuvers with aircraft. Our escort consisted of two or three old four-stack destroyers. Just before sunrise one morning, one of the destroyers, proceeding back to our convoy for refueling, reported sighting a German submarine cruising on the surface. The crew declared it would have been possible to throw hawsers aboard the U-boat and tow her back to the nearest port. But we were non-belligerents, and the two warships passed by.

When next we left Norfolk it was to take part in a surprise, combined operation originated by an astute tactician in Washington. We went to sea carrying Army B-25 bombers! Little did we think, when those swift bombers practiced taking off our flight deck, that they were making history. But we were to find that out. The pilots launched their craft in the most matter-of-fact manner. They weren't hesitant; they seemed to have the utmost faith in their equipment and planes.

Then came December seventh. The declaration of war found us berthed in Norfolk, but a few weeks later, after frantic preparations, we were ploughing the blue waters of the Pacific. We were soon plunged directly into practice for combat. A large number of Marine Corps aviators came aboard for qualification in carrier landings. These pilots, with their unorthodox airmanship, caused no small amount of shipboard chatter. They would roar down the deck, pull back the stick, and scat upstairs as if they were late for chow. Our Navy pilots usually made a slow climb after leaving the deck, and naturally the Marines were accused of plain and simple showing-off. However, I have since found that this more spectacular type of flying is typical of Marine Corps squadrons.

The Hornet's Great Adventure

Shortly, we berthed at a West Coast port, there to load Army B-25's. Now most of us were certain that within a matter of days we would be glimpsing the shores of Alaska through the fog, there to sling the bombers overside and continue on to some other destination. Actually, we were destined for a far more important mission.

The next morning several of us, returning from liberty late, made the stern of the carrier via Jacob's Ladder while the *Hornet* was forging her way toward the big Pacific. It was about the twenty-fifth of April, 1942. In company with another aircraft carrier, the *Enterprise,* several light cruisers, and some heavy cruisers, we were proceeding in a general westerly direction. For some time all had been well. Then, in the dark, thin hours before dawn, general quarters sounded and we took up battle stations. Every man had a question on his lips. Was it a hostile task force? An enemy carrier? Aircraft sighted? A sub?

Air cover flights from the *Enterprise* in the early morning had spotted two Japanese patrol vessels. Since we were on a rigidly guarded war mission, with the intention of attacking the coast of Japan, these two enemy ships might spread the word of our presence. It was not long before both vessels had been destroyed.

Destination: Japan

However, there was no indication that we were still undiscovered. All hands immediately fell to, helping warm up the B-25's that were already loaded with bombs of various descriptions. The morning was stormy; take-offs from the pitching flight deck would be extra-hazardous. Every man aboard feared the Army pilots might not make it. We held our breaths as Jimmy Doolittle, in the lead plane, revved up his engines, ran down the flight deck gaining speed, lurched into the air at a moment when the carrier was on the upward of a heavy trough, and was clear. With twin props churning the gray atmosphere, the plane continued to climb ahead of the ship, and a great shout went up. It seemed that the bomber, and the others that immediately followed it, was borne aloft by the wishes and hopes of every man aboard, as much as by horsepower.

Spray splashed across the deck in the half gale. Men on the forward gun mounts and in the arresting gear were soaked through, but they didn't feel it. Every face was wreathed in smiles as plane after plane left the ship without trouble, tight-roping the painted white line on the port side of the flight deck, and soaring away.

One Army co-pilot stuck his head from the cockpit window and waved as his plane whipped down the deck. The screaming wind snatched his "go-to-hell" hat from his head and flung it aft along the starboard side. I grabbed it for a souvenir.

Doolittle's plane flew over the ship for a bearing and headed for Tokyo. He was followed by all the other B-25's in turn, and they rapidly disappeared beyond the dim horizon, on the way to their historic mission.

Steaming in an easterly direction, we presently arrived at Honolulu, where we got our first glimpse of the American ships that had gone down during the raid on Pearl Harbor. The sight inspired in everyone a determination that fighting men, lost in positions where they could neither reach their guns nor leave the compartments, would be avenged.

Presently we left Hawaii and proceeded in a southerly direction at approximately twenty-nine knots. Activity aboard told us that we were scheduled to participate in an actual engagement with the enemy. We were headed, in fact, for the Battle of the Coral Sea, 26 May 1942. But we were just too late. When we arrived on the scene, other men and other ships had done a fine job. The *Hornet* returned to Honolulu.

The Hornet Roams the Pacific

Soon after 7 June 1942 we were at sea again, with the men in high spirits and anxious for a scrap. To the best of our knowledge, our position was to the north and west of Midway Island. With the Army coordinating its attack with the Marines on Midway, we were destined to hit the enemy from the sea. The first plane flight from the *Hornet* was to raid Nipponese shipping. The planes returned with full bomb loads, and with disappointed pilots and gunners. They had stayed out as long as possible without locating the enemy. However, at about 1100, we received more definite information on the location of the Jap ships. Again we launched our torpedo squadron, our bomber squadron, and the flight patrol of fighters. This time the Fighting Torpedo Squadron Eight hit the Japs with everything they had. Ensign Gay, sole survivor of the expedition, has already told the story of Torpron Eight after it left the *Hornet.*

In this battle one of our fighter pilots, who had engaged a Zero astern and within sight of the carrier, was shot by the Jap pilot through both legs. He reached the ship and succeeded in landing. But his plane in landing bounced two or three times and caught the last arresting gear. Automatically tripped, the machine guns in his plane opened fire, scattering fifty caliber slugs over the deck. Three Marines were lost on Mount Three. I was on Mount Four on the starboard catwalk at the time.

The lieutenant in charge of the mount and I were standing just inside the door. As the plane guns let go, we were about to step through the door, thinking that it was the last plane coming aboard. We hastily ducked back into the waiting room, where we could hear the exploding of the fifty calibers. In the accentuated quiet after firing, we carefully poked our heads outside and found an ugly bullet hole in the cowling right where Major Blais, our commanding officer, had been standing. We thought that he had been wounded or killed. But before long the Major was telling us over the phones to get up to Mount Three to assist the wounded.

In that battle we lost our first carrier, the *USS Yorktown.* The *York* was hit by several bombs from Japanese planes. We saw her last as she went over the horizon, smoking and burning amidships. A lot of our buddies were aboard that flat-top.

After a day or two we were ordered to proceed in a northerly direction for the Aleutian Islands, where the Japs were planning a great attack on our installations in that area. We had crossed the equator and were two days nearer the Aleutians when orders came to proceed to Honolulu instead. The jinx of inaction seemed to be following us around the Pacific.

Our next trip out of the Hawaiian area was to take part in the attack on Bougainville. After our tanker had left us, we made the ship ready for action. As usual, we went into General Quarters the night before the raid was scheduled to begin. The following morning found all eyes straining over the sea and into the sun for enemy observation planes. Our Interior Patrol shot down one such enemy aircraft before it could radio its base as to our position.

On the morning of the 5th of October, we launched our attack on Bougainville. The planes flew in to the island only to find the area blanketed by a dense fog without breaks for bombing. The *Hornet* had meanwhile turned south after the launching to receive the planes back aboard. As the distance covered was great, all hands were anxious, and counted the returning air fleet. One airplane was missing. Time dragged on. Twenty minutes later the stray ship came over the horizon, flew down the groove and landed.

He had flown the length and breadth of the island but failed to find an opening in the fog. But as he retraced his path he flew so low that he was able to locate a Japanese barracks. He dropped his one-thousand pound bomb squarely in the middle of it, and was gratified to observe pieces of timber and human bodies flying around his plane.

Off Guadalcanal

Our duty for the following few weeks was ordinary patrol, a humdrum routine except for a few enemy patrol bombers disposed of by our effective Interair Patrol. In that section of the Pacific known to the men of ships as Torpedo Junction we lost our sister carrier, the *Wasp.* Like the ill-fated *Yorktown,* the *Wasp* was on fire with several heavy bomb explosions on her decks. We surmised that her bomb magazines had been hit and that the loss of life aboard her must be tremendous. We men of the *Hornet* had so far been lucky, but we were learning what death can be like.

Our next attack was a raid on the islands lying to the north and east of Guadalcanal. There we inflicted heavy damage on enemy concentrations of men and ships. At one time we lay off Guadalcanal so close that we could see a clearing which we presumed to be the famous Henderson Field. Presently, over the mass of jungle growth, there came a lone plane piloted by a Marine aviator. He circled our ship and, upon receiving permission, swooped low over our deck and dropped a

note. Scuttlebutt immediately reported that the note gave a new location for Japanese shipping which had been making sneak raids on the island.

Within the hour we launched an attack designed to break up the concentration of ships. Our flights searched far and wide, but discovered no sign of the enemy. And so ended our duty northeast of Guadalcanal. We were becoming veterans, and rested secure in the knowledge that we had been instrumental in saving some of our buddies in the Marines who were fighting in the islands, as told in *Guadalcanal Diary* by Tregaskis.

The Hornet Under Fire

On or about October 15, while we were still on routine patrol in the southwest Pacific, we received word that once again a strong force of the Japanese was approaching Guadalcanal. Our orders being to break up the attack at all costs, we immediately steamed in the direction of the Stewart Islands, from which the Japs were threatening.

On the morning of October 26th, we launched an attack on the Jap ships. The next thing we knew we were at battle stations and ready to fight for our lives. At last the day had dawned when we must slug it out or go down.

My first sight of enemy planes was a group of high altitude bombers approaching. Then, as I looked out over the starboard rail, I saw low-flying planes out on the horizon: Jap torpedo planes. Soon their first tin fish hit us directly under Mount Four amidships. We had been firing at the plane long before it dropped its torpedo, and it was already afire around the engine cowling. As it swooped up from approximately three feet above the water and started its climb, we thought it would crash into us. Having a general idea of what that would be like, we crouched, and were immensely relieved to see him clear the mount and crash into the sea on the port side.

A few moments later all hell broke loose around us. Bombs fell on every hand, torpedo planes were flying in at us from every quarter. The rattle and chatter of our guns in the aft batteries was our only hope that we might be able to beat off the attack. The other ships around us in the convoy were also firing like mad.

Then, a Jap plane that had stayed upstairs until the rest of the flight had inflicted its damage, made a swoop over our deck, releasing a five-hundred pounder. In Mount Three we were firing at point blank. It occurred to me that the pilot was actually on a suicide mission, that his commander had told him to get the *Hornet* at all costs. He released his bomb, which I saw plainly as it came down, and opened up with his machine guns, strafing our deck. I fell, as I had been instructed, on my stomach. With my head cocked in my elbow, I watched a perfectly straight line kicking up the deck some eight or ten feet away. Bullets! This plane also must have been hit because as it pulled out of its dive, it turned on its left wing and crashed into the Klaxon horn on the side of the funnel. It started a fire amidships. The smoke was heavy, and as we lay dead in the water it prevented observation of much beyond twenty feet away. Firing our guns through the smoke was almost impossible, for the smoke blinded us.

Now, over our phones, we heard warning of the approach of another bomber or torpedo plane. We immediately swung the mount around and opened fire in the general direction from which

A B-25 soars off the deck of the U.S.S. **Hornet**, to blast Tokyo, Yokohama, and other Japanese industrial cities. It gave the Japs their first knowledge of bombs on the homeland.

The Hornet lists to port after the forenoon attack. A cruiser and a destroyer stand by.

the plane was supposed to be approaching. We could not see our target, but we kept on trying.

A bomb, and the plane as it crashed into the deck, must have hit me and several other men in my mount. The first thing I knew the attack was over, and I felt numb. But soon I had recovered sufficiently to make the guns ready for another attack, it was launched.

Meanwhile Major Blais, commanding A. A. Aft Control, ordered me over the phones to make a survey of the dead and wounded of the aft batteries. I complied with his order and started down the starboard side of the ship toward the fantail. On my own Mount Four no casualties were reported, but on the first of the twenty millimeter batteries I found two dead, three wounded.

I learned that the bomb hit had caused freak incidents for two of the men. Corporal Rector lost all of his clothing, probably blasted off by the concussion. Another chap reported that the bomb snatched a watch off his wrist, after breaking the strap. The watch was found nearby, still running.

Counting the Dead

I proceeded farther down the starboard side of the fantail. There was death and desolation on the aft twenty-millimeter battery. I tried to make an accurate estimate of the dead and wounded. Next I crossed the ship to port, there to take the same check. One of the batteries there was wiped out.

I reported to the major via phone on the port side. He ordered me to traverse the territory just covered and pick up all the dog tags from the slain men. This I did, reporting in person to Major Blais at A. A. Aft Control. One of the officers wrote the names and service record numbers from the tags on a paper and put it in his hat; the tags were taken to the First Sergeant of the detachment so that there would be a second, separate record in case either man were killed.

When I returned to the fight deck I felt a warm sensation in my shoes. I removed one of them to find it full of blood. The other was almost as bad. As the ship was making preparations to ward off another attack, I asked a corpsman if he would cauterize the wounds in my feet. He took a look, then said, staring at me, "Sarge, what in hell's holding you up?"

The Hornet's Last Hours

It was only then that I made a complete check up. The front of my torn clothing was quite covered with pieces of human flesh and spattered with gore. Actually, I looked worse than I felt.

Another Marine from one of the twenty-millimeter batteries came staggering past with his back peppered with shrapnel. We cornered him and ripped off his shirt. The doctor, who happened to be passing by on other cases, stopped and asked the man if he could do anything for him. He replied, "No sir, there is nothing. The only thing I want to do is to get back in the harness of my gun and keep on firing!" The doctor ordered him to take a rest below.

Later on, when I could stand the pain in my feet no longer, I requested permission to board a destroyer which had drawn up alongside and was taking off our wounded. The request was granted, and I went below by ladder to the stowage deck. There my eyes greeted death and blood once again; men lying in confusion were minus heads, arms, legs and feet. I was looking for Gunnery Sergeant O'Connor. On the flight deck they had told me that he was blinded, and was seriously wounded, if not dead. Lifting a coat, I found a stranger in two pieces. I was too shocked to look farther for O'Connor. But then, with my seabag loaded and waiting transfer by bosun's chair to the tin can, I suddenly heard O'Connor say, "Gillis, how are the men weathering it?" He had recognized me, so I knew he was not blind. I reported such information as I had, and shortly thereafter it was my turn to board the destroyer. I made the weather deck, and almost immediately the destroyer veered quickly away from another Japanese attack aimed at our carrier.

I found a steel helmet lying handy, and put it on. The tin can, by now some fifteen or twenty lengths away from the *Hornet,* was letting go with everything she had.

The second wave was a small one, and flew over the rest of the fleet to attack the *Hornet,* which was

stationary in the water. That afternoon there were two more attacks on the Old Lady, both of which I witnessed from the deck of the destroyer. Each time she suffered additional damage.

At six o'clock the *Hornet,* listing heavily to starboard, was still afloat. At about seven o'clock the hour before darkness, she was abandoned by her crew, leaving aboard only her gallant dead. Circling madly about her, expecting a fifth attack at any moment, we darted in close to pick up men that were swimming and floating in the sea.

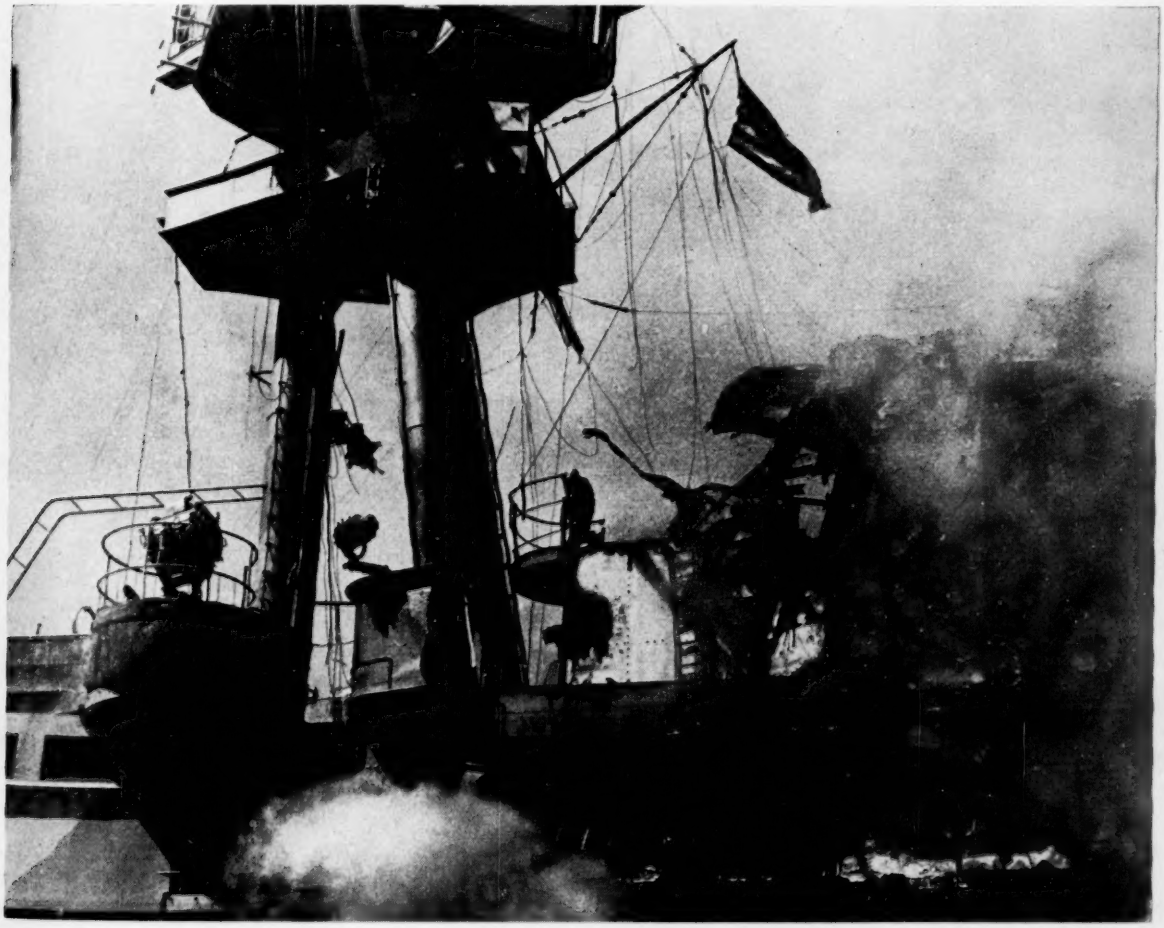
A small boat came alongside our destroyer as she stopped. One of the first men over the gunwale was our First Sergeant. He was a comical sight. When he left the ship he had jumped over the rail into the sea, which at that time was covered with a film of fuel oil. His face, hands, arms and clothing were smeared with oil, and as he stuck his face above the gunwale someone wiped his eyes with a towel or piece of rag. At this moment I recognized him, and the white of his eyes against the black of the oil made him look like an old-time minstrel man.

We were still within range of enemy bombers, and if we attempted to tow the *Hornet* out of the danger zone we would be subjected to repeated attacks. It was decided to sink the Old Lady by the guns and torpedoes of the convoy. This was accomplished at approximately eleven o'clock that evening, and the *Hornet,* with her honored dead, slid gracefully below the waves.

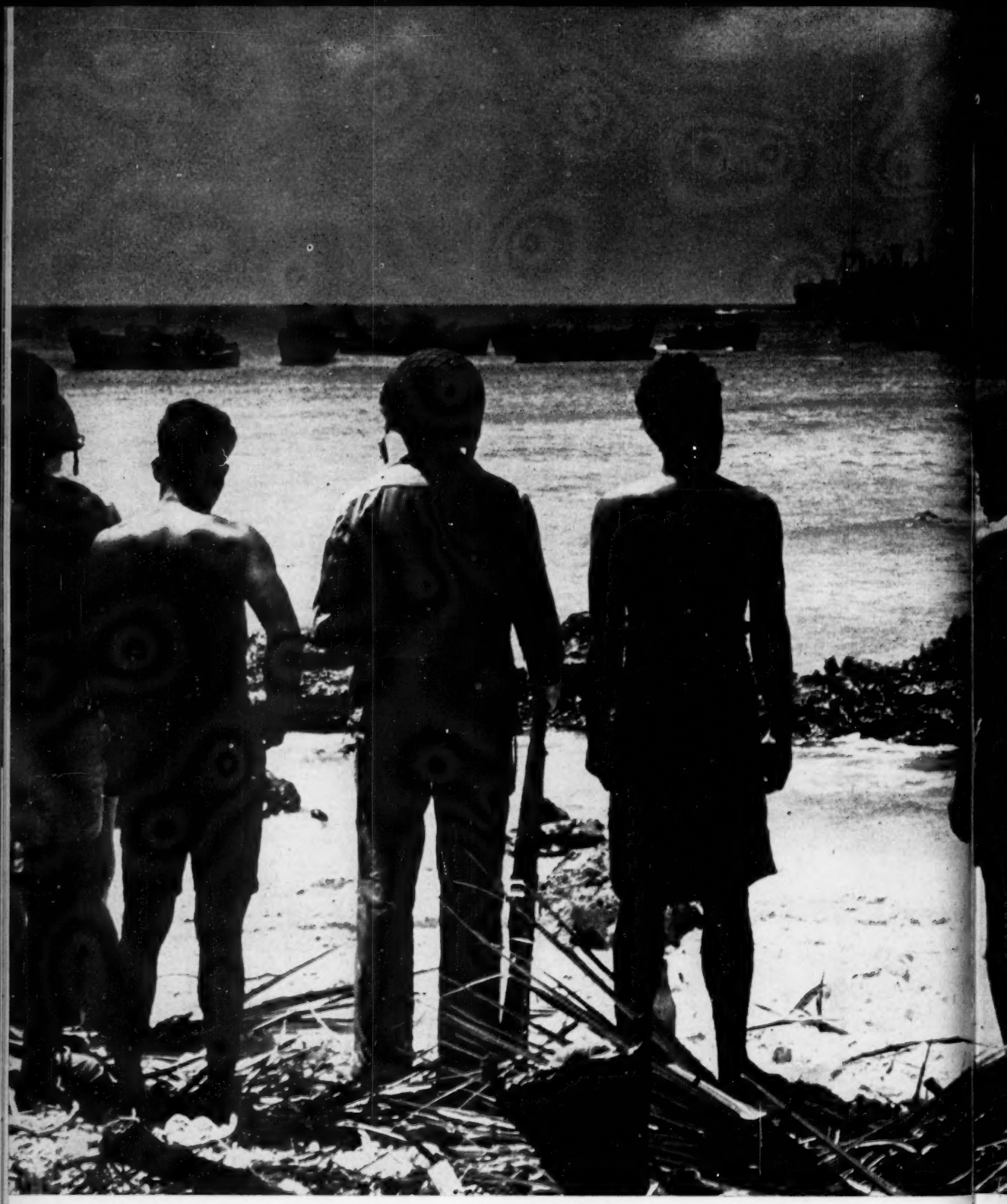
Goal for a New Hornet

Today, another and even mightier *Hornet* is ready to rain death and destruction on the Japs, sending their warships and airplanes to the bottom, and bombing their war centers of the Japanese homeland into rubble. I applied for a berth on her, but my application has been denied. Others will have to take my place, and the places of those lads who cannot ever again answer the call to "battle stations." They have a noble heritage, an indomitable tradition to uphold. They will answer for those heroes who went down with the old flat-top in the South Pacific.

The new aircraft carrier *USS Hornet,* with a name like that, cannot fail. **END**



The colors still fly from the gaff of the **Hornet,** afire and mangled after a Japanese dive bomber has crashed on the signal bridge. She was finally sunk when all hope was gone.



White Man's War Canoe

Natives of Makin stand in awe along the beach as they watch the Navy task force lying off shore. They welcomed the U. S. invaders.

Makin lies on the northern ound
which Willard Price in Jap's Is
"Here American Marines su red
ing boats struck coral ree and
ashore, a distance of eight hdred
After seeing how often the pan

thern oundary of the Gilbert Islands, of
n Jap's **Islands of Mystery** has written:
es suffered severe losses when their land-
reef and the men were forced to swim
ight hundred yards, under merciless fire. . . .
the panese miscalculated the wind and tide in the Nanyo lagoons with which they had had two decades to become acquainted, one is not disposed to quarrel with the explanation of Secretary Knox that a sudden shift in the wind lowered the water, causing the boats to hang up on the coral. Indeed the Marines will be in rare luck if the same sort of disaster is not many times repeated . . . at Ponape, Truk, and Palau."

Jungle Warfare

Continuing from the June issue a distillation of the best knowledge of jungle warfare gained by Marines who have fought in the Philippines, Guadalcanal, New Georgia, Bougainville, and New Britain. *By Marine Corps Schools, Quantico, Va.*

IT is important to realize that distance in the jungle does not necessarily bear any relationship to time. In temperate zones on decent roads, troops can be expected to maintain a rate of two to three miles an hour. In the jungle, the rate will rarely exceed one mile per hour. In the case of a battalion moving over a poor trail, the rate may be reduced to one-half mile per hour.

Jungle trails will usually restrict the formation to a column of files. Advance and rear guards are detailed. To facilitate control, to improve security measures, and as an aid to more rapid movement into battle, elements in the column move as units, as compactly as possible. Connecting files maintain liaison between the elements of the column and between the main body of the column and the advance and rear guards. It is not the duty of the advance and rear guards to send connecting files to the main body. The main body sends these files out. Advance and rear guards should be changed daily. Within them there should be rotation of assignment. The same squad should not be kept in the point for more than two hours, for point duty is very demanding.

Elements on the March

Flank patrols must be sent out when the situation dictates it and when the terrain permits. When a rapid movement is being made in an effort to gain surprise, it would not be advisable to send out flank patrols if they have to cut. The pace of the column would be slowed and the noise made by cutting would alert the enemy.

All lateral trails must be investigated for several hundred yards and covered by combat patrols until the column has cleared them. These combat patrols are sent out from the advance guard. After the column has cleared the lateral trails, the combat patrols rejoin the column, falling in at the rear. They rejoin the advance guard at the next hourly or periodic halt.

Distance between men on the trail varies from one to three yards. The column commander may march in any position; he is situated to deal quickly with any situation. He should always have with him his operations officer and one runner from each element of the column in addition to several runners from the headquarters group.

Radio communication within the column may or may not be permitted. Usually it will not be. Until ultra portables with dependable performance characteristics have been combat tested, runners must be considered the primary means of communication.

It is the duty of all to observe strict trail discipline. No talking can be permitted except in whispers. The commands to halt the column will in all cases be given by an officer.

Importance of Discipline

Trail discipline is always essential. In the jungle, this is particularly so, for there the enemy is afforded opportunities for ambush that do not exist under normal conditions of combat. The following points are particularly important:

(1) Prescribed distances must be maintained on a jungle trail. The distance between men and between elements of a column will be less than under normal conditions. Jungle trails are narrow, are often confined by walls of brush on both sides and are tortuous. Therefore, if contact is to be maintained, all members of the column must be alert to prevent "accordianing."

(2) Loud talking is strictly prohibited.

(3) Men leave the trail and stand motionless on the approach of aircraft.

(4) At halts, men may relax physically. They can never afford to relax mentally.

(5) If men fall out, they must be left behind.

The speed of the column will be dictated by the terrain, the heat, humidity, the condition of the trail, and must be adjusted to the speed that can be made by the men of the weapons platoon who are carrying machine guns, mortars and heavy ammunition loads. If this procedure is followed, there will be few if any stragglers.

On some terrain, the column may be able to march about forty or forty-five minutes and to rest for the balance of the hour. Under more trying conditions, the column may march for fifteen minutes and then halt to rest for ten minutes.

All hands should be provided with salt tablets or ordinary table salt before the march starts. Personnel will be instructed by doctors and corpsmen how often salt is to be taken. Halezone tablets or individual CDC units for the purification of water are also distributed every time troops water.

All weapons must be thoroughly cleaned and oiled liberally, and all ammunition inspected before the march starts. Oil soaked rags, dark in color, that can be removed with a quick jerk should be wrapped around all operating mechanisms to

protect against humidity and the mud that will clog mechanisms if the men fall, as they frequently do. All rifles and carbines are carried loaded and locked. BAR's and sub-machine guns are carried with magazines in, bolts forward. In the advance and rear guard, weapons are carried ready for instant use. In the main body they may be slung. Except in the point, bayonets are not fixed during the march, as they catch in vines and bushes.

During a jungle march, two meals are eaten daily, morning and evening. No noon meal is eaten, though a rest period of about forty-five minutes may profitably be ordered at about halfway mark. During this period, men should be encouraged to drink chocolate, lemonade or bouillon prepared from powder in the "K" or "J" ration. All these drinks are swiftly assimilated by the body and are palatable and refreshing.

While the squad is on the march as part of a column, the squad leader is responsible for the enforcement of trail discipline. He will insure that his squad is closed up, that proper distances are maintained and that contact is not lost. He will not permit straggling, falling out or talking. He will verify and pass on correctly all "words" and instructions relayed through his squad by word of mouth.

Columns on the march are halted only by the order of an officer. The use of the phrase "hold it up" must not be permitted.

When the column makes any halt, all hands immediately leave the trail and move into the bush on alternate sides, facing out in positions of readiness. If the halt is a periodic one of ten to twenty minutes duration, security must be pushed out on either side of the trail. The remainder of the men may relax and should be encouraged to do so, and for those not on security, permission should be given to lie down or to rest against logs and stumps. During rest periods men must keep one hand on their weapons at all times. Periodic halts should be called when it is the approximate time for such halts and when the larger portion of the column is on defensible ground.

Site of the Bivouac

A bivouac site must first be defensible and second be near fresh water. In the jungle, neither requirement will be hard to satisfy. High ground is desirable for a bivouac, not only because it is defensible but because it is freer from flies, mosquitoes and other insects than is low ground. Also, it is better drained and cooler.

A native village should never be selected as a bivouac site. This precaution must be taken not only because the enemy may have the village spotted but because there may be unfriendly villagers present. Also, the ground in the vicinity of native villages is often fouled, and our troops may contact dysentery or other diseases if a night is spent under such conditions.

Tasks Before Nightfall

The halt for the night must be made in time to permit the following:

(1) A brief reconnaissance of the bivouac area and assignment of units to sectors for all around defense.

(2) Movement of the troops into the assigned sectors.

(3) Clearing of limited field of fire for automatic weapons.

(4) Preparation of hasty all around defense. Digging of fox holes, siting of machine guns and automatic weapons and preparation of shallow emplacements.

(5) Excavation of straddle trenches.

(6) Preparation and consumption of a meal.

(7) Completion of arrangements for sleeping.

One-third of the men should prepare their food while another third is busy in preparation of their positions, and the remaining third is on security. On completion of tasks, details are rotated within squads.

It has been found that a battalion will require approximately three hours to make these arrangements. Accordingly, the halt for the night will have to be sometime between 1430 and 1600.

After the area of the bivouac has been selected and the troops moved in to assigned sectors, the column commander will usually hold a conference, at which time the pass word for the night and the plans and orders of march for the following day are issued. Meantime, platoon leaders check their security, the progress of the fox holes and emplacements, and the progress of cooking.

Final Precautions

Each platoon must have a designated straddle trench. It may be desirable for each squad to have one. To the extent humanly possible all calls of nature must be attended to before darkness. If a man is required to answer a call of nature after dark he should dig a small hole by his fox hole.

The smoking lamp is out and all fires are extinguished at sunset. Cooking is done with heat tabs, Sterno or similar smokeless preparations.

Mortars must be set up within the bivouac area so that they can fire barrages in support of the defense. Mortar crews maintain the same watch schedule as is prescribed for other troops; that is, one third of the crew of each mortar must be awake during darkness and all crew members must be alerted at sunset and again prior to dawn.

Health, Hygiene and Sanitation

The rigors of jungle campaigning, the heat, humidity, and dietary deficiencies all tend to cause loss of weight and to lower resistance progressively. These conditions affect the combat efficiency of a command, and are the reasons that periods of rehabilitation are necessary after several months of active operations in the jungle.

Our most persistent enemy in the jungle is neither the climate nor the Japanese, but the malaria-carrying mosquitoes known as anopheles. Malaria has inflicted on our troops several times the number of casualties that have been inflicted by the bullets or bombs of the Japanese.

The incidence of malaria can be decreased to a great extent if all personnel are indoctrinated in the subject of "Malaria discipline."

Thousands of man days are lost in jungle campaigns due to gastro-enteritis, dysentery, and other stomach and bowel disorders. When gastro-enteritis sweeps through a unit, it puts every officer and man on his back. On one occasion a company had one hundred men out of 140, or over 70%, completely knocked out by gastro-enteritis for a period of five days. This disease is spread by man's carelessness. It is the direct result of failure to observe elementary sanitary requirements relating to disposal of human waste and garbage, sterilization of mess gear, and observance of the very common sense sanitary regulations covering the preparation and serving of food.

Eating Clean Food

No food should be handled with the hands when eating implements are available. Mess gear should be sterilized both before and after using. After sterilization following a meal, mess gear should be hung up to dry in the sun and not crammed back inside a dirty pack. Obviously, it is impossible for troops who are engaged to comply with these regulations during actual combat, but troops in any combat theater never spend as much as 10% of the time in fighting, and during the remaining 90% of the time, they must comply with elementary sanitary requirements.

The most effective way to insure that sanitary regulations are observed is, first, forcefully to impress upon all hands the absolute necessity for such observance, and, second, to discipline those who violate them, immediately and severely.

Tropical ulcers are common afflictions in jungle climates. They often start from small skin cuts made by coral or thorns. All such minor cuts must be immediately treated. Several applications of sulfanilamide powder may be necessary before the cut heals. These cuts should be covered to protect them from dirt. Small pieces of adhesive, or the commercial "Band Aid," are satisfactory for this. If such cuts are permitted to go unattended, they will usually become a focus of infection, the affected area will increase in size, and serious complications are likely to follow.

Trench mouth is sometimes contracted in the jungle. If not promptly treated, it will result in loosening of the teeth and eventual loss of them. Any unusual soreness or tenderness of the gums should be reported to the medical personnel.

Bathing and Laundry

Men must bathe daily in the sea or in fresh water when possible. During combat they will have no chance to do this, but as soon as they have a chance, they must bathe thoroughly. It will be found a good idea to order sea bathing by platoons, for some men are so lazy and irresponsible that they consider it too much "trouble" to take frequent baths.

Clothes must be washed when possible. If there is a limited supply of fresh water and soap, men must be required to keep underclothes and socks clean. Of course, if they have the opportunity, they should wash their outer garments as well. Boiling clothes will kill all bugs and will diminish skin infections. If conditions permit, clothes should be boiled twice a week.

At the end of a day's march, after foxholes are dug and the evening meal eaten, men should wash, dry and powder their feet and change their socks. Feet should be thoroughly dried because fungus infections are caused by dampness. They should wash the socks they have taken off. Each individual will have a small can of issue foot powder which is quite satisfactory. There are also many commercial brands available. Men must take care of their feet. Platoon leaders assisted by noncommisioned officers should inspect shoes, socks and feet frequently. The socks are as important as the shoes. Men should be required to wear woolen socks that fit. To prevent socks from working down into the shoes, they should be pulled up over the trousers and secured with string.

There are no troop carriers in the jungle except the two with which God has equipped everyone.

Hair should be clipped short before going into a jungle operation. The growth of beards should be discouraged. It is true that a luxuriant beard lends an air of distinction to the wearer, but the simple fact is that in the jungle where they cannot receive care, beards are not hygienic. Added to this is the fact that beards complicate the problem of the surgeon enormously in case the wearer suffers a face wound.

All water is treated. On the march, halezone or CDC tablets are issued in the rate of one per canteen of water. It takes about twenty minutes for halezone or CDC to dissolve. In camp, all water is chlorinated and lyster bags used. Contaminated water is a primary source of dysentery and other intestinal disorders.

After movement into the bivouac area, doctors and corpsmen examine and treat those who have foot complaints, coral cuts, or who have been slashed by vines. At this time the daily atabrine is issued and halezone or CDC and salt tablets for the following day's march distributed to squad leaders.

The pass word for the night is relayed to all hands. There is an unlimited variety of phrases that could be chosen, for the Japanese have difficulty with our letters "L" and "V".

During the night one-third of the command must stay awake. The platoon commander, the platoon sergeant and the platoon guide is each awake and alert for about four hours.

During the night, strict fire discipline must be maintained. There will be no firing, even at occasional snipers. Firing is only justified when an actual attack is being made on the position.

Approximately one hour of daylight will be needed to get moving in the morning. Men prepare and eat breakfast, check the adjustment of their equipment and move off on order. Security detachments are the last to move out of the area.

Duties of the Squad Leader

When the column halts and the area his squad is to occupy has been indicated, the squad leader moves the squad in. He posts a security group of two to four men forward of the position the squad is to occupy. He makes a reconnaissance of the position and:

(1) Posts the automatic riflemen and indicates to each the sector for which he is responsible.

(2) Posts the riflemen and indicates to each the sector for which he is responsible.

(3) Supervises clearance of limited fields of fire.

(4) Supervises excavation of fox holes.

(5) Ascertains location of platoon straddle trench and informs squad.

(6) Ascertains location of platoon CP and informs squad.

(7) Ascertains location and fire missions of adjacent squads.

(8) Checks on preparation of the evening meal.

(9) Inspects weapons and ammunition.

(10) Inspects feet.

(11) Checks on progress of work and eating and insures rotation of groups.

(12) Personally sees that each man takes prescribed dosage of atabrine.

(13) After securing orders from the platoon leader, he issues the pass word and his orders for the night. Informs squad of time of resumption of march.

(14) Informs squad of the location of his fox hole and that of the assistant squad leader.

(15) Before resumption of march, checks on area for forgotten or mislaid equipment.

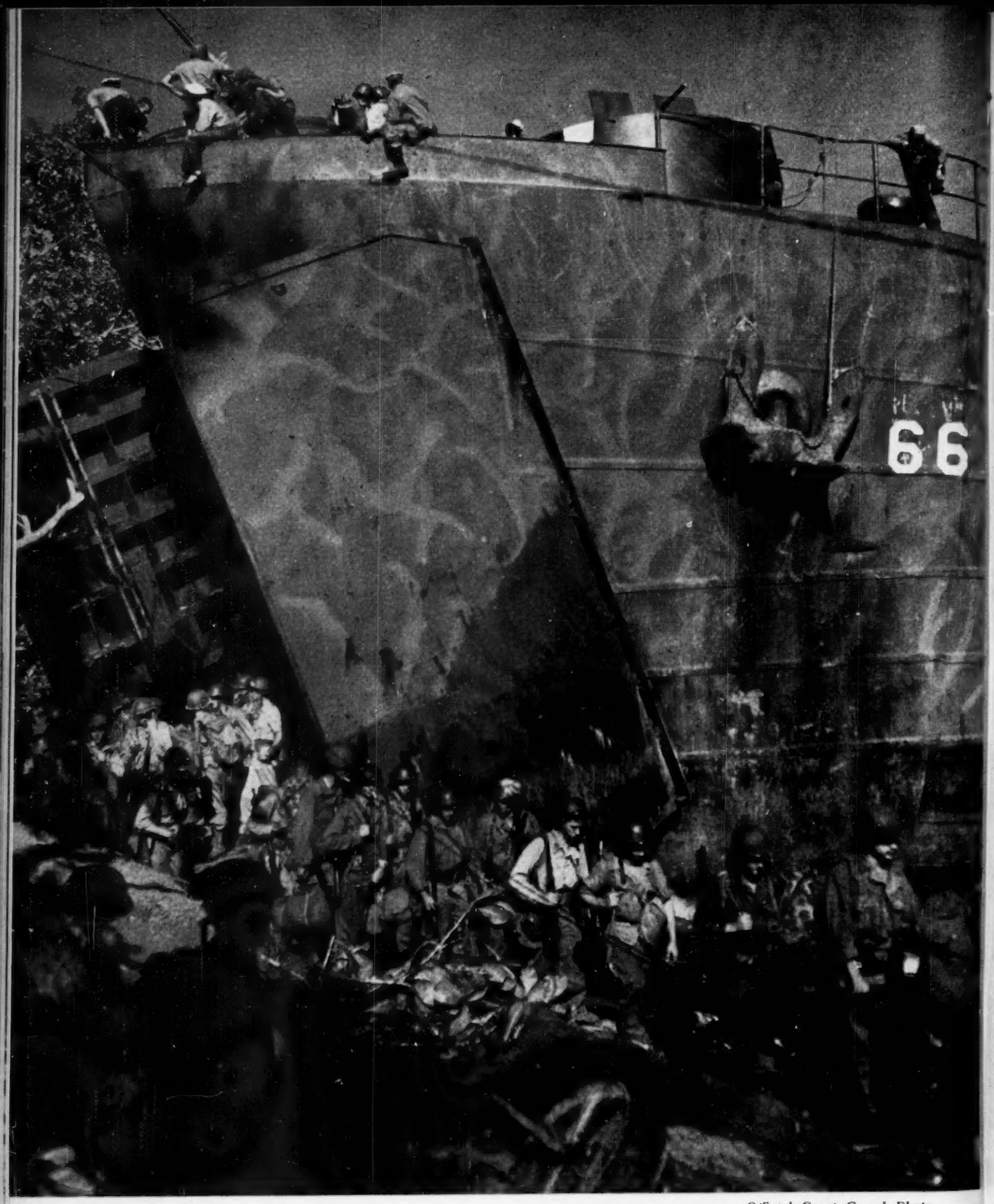
With a unit the size of a company it has been found a good plan to halt at about 1500, feed, clean weapons, answer calls of nature, change socks, and so forth in one area and then, about forty-five minutes before dusk to drop back to a night bivouac area previously selected and reconnoitered. This bivouac area need be only at a short distance from the area where the "administrative" halt was made. Movement to the night bivouac area must be made in time to allow siting of automatic weapons and excavation of fox holes.

Security in jungle warfare is continuous. It never lapses. In jungle warfare, there is no "front." It must always be considered that contact is imminent and that the enemy may appear from any direction.

When planes approach the vicinity of the column, all hands halt, step to the side of the trail and stand motionless in the shadows. No one looks up. If these precautions are observed, it will be impossible for air observers to see the column regardless of the altitude or speed at which they are flying.

Security in the bivouac area is assured by a number of listening posts established outside of the defensive set-up. The men on these posts should remove their helmets. They may occupy two or three man fox holes. Either the two or three man fox hole is preferable to a one man fox hole. Men may sleep in, or immediately adjacent to fox holes.

Whenever possible, all personnel should sleep off the ground. This will not be possible when troops are engaged, but when in rear areas, it should be a standard rule. The army jungle hammock is an excellent piece of equipment, will keep the sleeper off the ground, dry, and will protect him against mosquitoes. If no jungle hammocks are available, platforms should be built several inches above the ground. These can be covered with jungle ferns and leaves. **END**



Official Coast Guard Photo

Hollandia Landing

From the jaws of an LST, manned by the Coast Guard, troops and equipment are disgorged on the beach near Hollandia, Dutch New Guinea, as anti-aircraft crew stands guard. The object of the landing was to secure the strategic shores of Tanahmerah Bay.

Editorials

★ ★ ★

The Invasion Begins

As we go to press, the first phase of the long-awaited invasion of Western Europe—securing beachheads—has been accomplished. Military leaders applaud the success of the operation, but caution the people against over-optimism as our armies square away to confront the tactical and strategical reserves of the *Wehrmacht.*

To date, Marines have been reported active in only a minor role, but one to warm the blood of Marines everywhere. Picked Marine sharpshooters rode high on the masts of the big ships of the bombardment force, and picked off floating mines with their rifles. Thus again the skill of the Marine with the rifle is recognized, and an interesting historical parallel evoked. The major battle task of Marines in the early days of the Republic was to perch high on the tops and cross-trees of men-of-war and harass the decks of the enemy warships with accurate and deadly rifle fire.

What Makes A Professional Magazine?

There are today in the United States countless thousands of professional and technical magazines. Some are good, some are bad. The vast majority fall into the great oblivion of mediocrity.

The editors of the GAZETTE feel that the Marine Corps is entitled to a *good* professional magazine. The motivating factor behind our entire editorial scheme is to publish a magazine that will help our readers *think*; information handed out on a platter does not necessarily result in intelligent thinking on the part of those who read the publication. Our goals are to secure the right information, process it mechanically into an attractive package called a magazine, and achieve our ultimate purpose of promoting intelligent thinking.

The first of these goals is difficult. Officers are busy, concerned with vital problems that consume their entire time and energy. Many feel they have a story to tell but feel that they are inadequate as writers. To them we would like to say: "The final test of writing is what you say, not how you say it." We need cooperation and help from the officers of the Marine Corps in the form of material for publication. We want thought-provoking material.

The second part of our program—the physical appearance of the publication—is primarily our concern. We feel confident that we can produce as fine a looking publication as any.

The third and most important point—to promote intelligent thinking by our readers—will be the most challenging because it requires effort on our part as well as theirs. For the most part, the readers of America have been lulled into laziness by picture magazines and digests. We intend to present stimulating information of professional interest to our readers. We hope that when you disagree you will feel free to write your opinions.

Prize Article Contest

To assist in achieving our first objective with this magazine—securing and publishing the right information—the Commandant of the Marine Corps has authorized a $500 prize for the best article written by a Marine between this time and October 15th on some technical or professional aspect of the military art. Full details of the contest are announced inside the front cover.

Editorial Advisory Board

At the Editor's request, Lieutenant General Vandegrift has also authorized the establishment of an Editorial Advisory Board for the GAZETTE. The Board will include the Directors of the Division of Plans and Policies, the Division of Aviation, the Division of Public Relations, and the Commandant of the Marine Corps Schools. Meeting every two months, the Board will "discuss editorial policies, and advise the Editor on trends of military thought and the type of material most suitable for publication in the GAZETTE."

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WHAT'S NEW

Review of the Latest Developments in Military Equipment

U. S. Now Has Sixty-Five Carriers

Artemus L. Gates, Assistant Secretary of the Navy for Air, has announced that sixty-five aircraft carriers are now in active service with the fleet, and that Navy planes of all types will soon total 37,700. Meanwhile, Robert H. Wood, Editor of *Aviation News,* called for congressional approval of a post-war program of at least 50,000 Army and Navy combat planes, plus trainers and transports, and annual production and replacement of 25,000 of most advanced combat aircraft. He also urged peacetime Army and Naval Air Transport for training and supply.

V-12 Program Curtailed

Over-all reduction of twenty-five percent in enrollment of 70,000 students under the Navy's V-12 program by November first was announced by Vice Admiral Randall Jacobs, Chief of Naval Personnel. The move affects the fifth class of officer candidates for the Navy and Marine Corps scheduled for training at 131 colleges and universities over the country. As needs of the Navy decrease, officer candidates must be curtailed, the Admiral explained. He added that no school would be reduced in quota below the 250 necessary for efficient operation. Army Service Forces plans increased non-combatant instruction.

Army Air Forces Photo

Army's newest Mustang has additional firepower in six .50 calibre machine guns, tactical radius of 600 miles, and rollback cockpit enclosure with 360-degree vision.

Helicopter with Pusher Prop

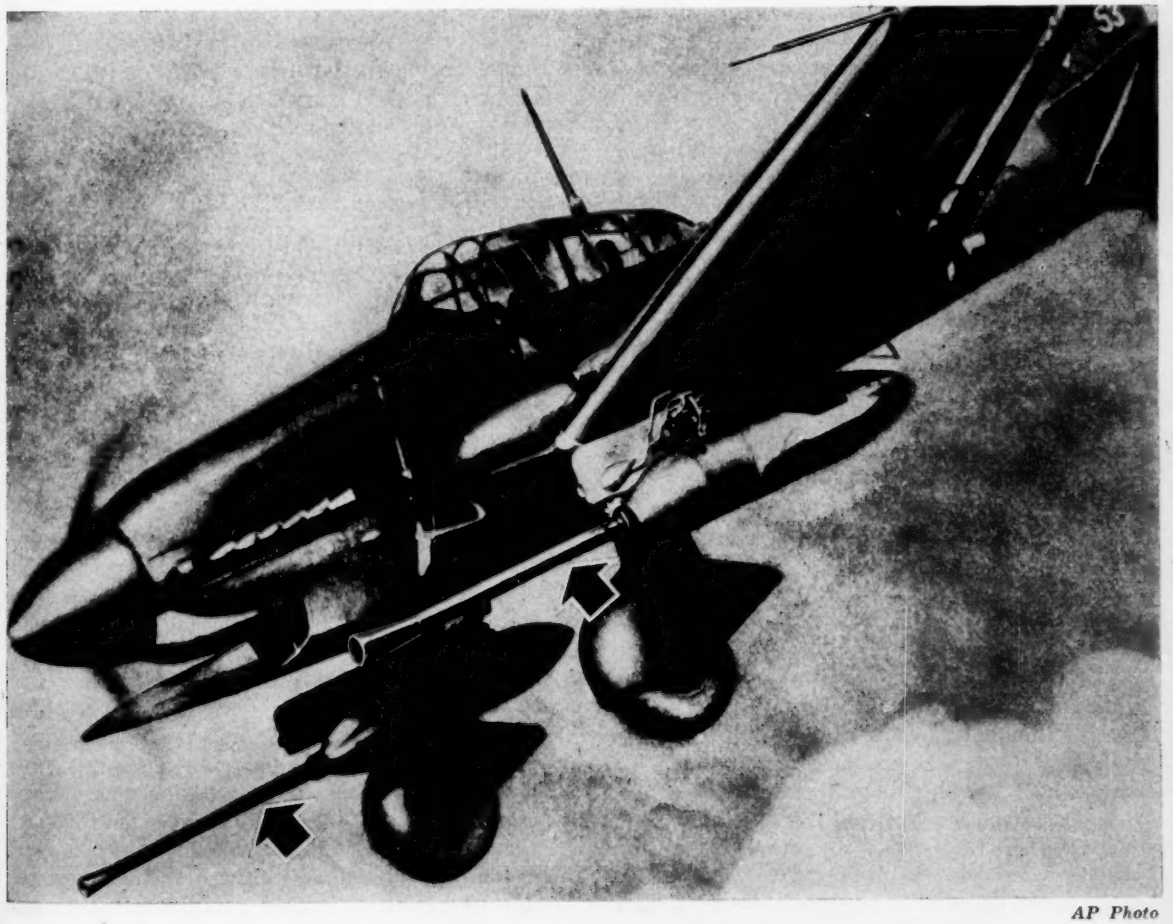
New type helicopter with counter-rotating rotors and a pusher propeller has been designed by Arthur C. Schouw, Detroit aeronautical engineer. Tests show the new ship practicable, and plans are under way for manufacture at estimated cost of $2800 each. The H-100 is similar to a Focke-Wulf flown successfully in Berlin in 1937. Main difference is in propellors. The German had puller-type power. Controls are less sensitive than on the conventional helicopter, it is claimed, hence the new craft is easier to fly.

Schouw explains that stability is gained by offsetting torque through having the rotor turning in different directions. With both rotor blades extended, the plane, 8 feet high, has a width of twenty-four feet. It has a 105 horsepower, four-cylinder, Continental engine designed to provide a ceiling of 10,000 feet and cruising speed of 95 miles an hour and top speed of 110 miles an hour. Auto rotation in case of engine failure is automatic, and a parachute designed to lower the helicopter to earth, if necessary, is provided.

Fight War Neurosis with Drug

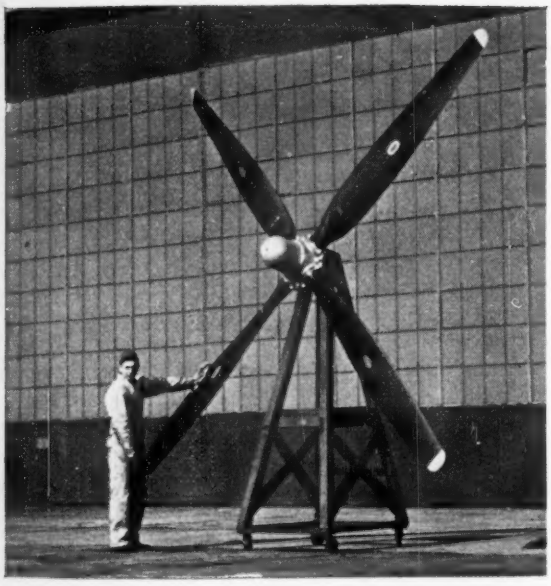
Use of ergotamine tartrate, a drug normally used for treatment of migraine, is successfully countering "battle fatigue," now leads to possibilities that the medicine should be administered as preventative as well as cure. U. S. Public Health Service Drs. Robert G. Heath and Florence Powdermaker used the drug in treating merchant seamen at the Gladstone, N. J. rest center. These men suffered from war fatigue or emotional breakdowns stemming frequently from overwhelming exposure to battle conditions.

Ergotamine tartrate acts on the autonomic nervous system and hence was used instead of sedatives to influence the output of adrenalin in the body. Fairly large doses given every three hours for 10 days restored to health 20 men suffering severely from battle reaction. No ill-effects were observed in the men so treated, and there was no slow-down in mental processes or in coordination, hence the suggestion that the drug might be used as a prophylactic to lessen anticipatory anxiety prior to combat experience.



AP Photo

New Nazi war plane, described in German magazine, is said to carry two 37mm cannon, as shown by arrows, and is supposed to be designed for use against tanks.



Hamilton 4-bladed hydromatic propeller 17 feet in diameter, largest in quantity output.

Burn Treatments

Navy doctors are now using two methods for treating burns—thin sheets of dried blood plasma and medicated paraffin wax spray. The U. S. Navy Medical Bulletin states wounds covered by either system require no further dressing. With plasma, transparent sheets are made by dissolving dried blood plasma in water and heating. The sheet is impregnated with sulfa and is then laid on the burn, where it transmits the blood fraction fibrin, which promotes coagulation. Healing in six to nine days of wounds previously resisting cure for as long as two months is reported under the new method. The wax spray is applied to wounds after first dusting them with sulfa, and relieves pain almost instantly. The Army reports from Britain unusual success with skin grafting on severe burns from plane and tank operations, some grafts covering up to thirty percent of the body surface.

Salt May Replace Plasma

Surgeon General Thomas Parran of the U. S. Public Health Service has informed the Congress that special solutions of common table salt and other sodium salts eventually may replace blood plasma in treating the wounded and burned. He referred to a technique developed by Dr. Sanford M. Rosenthal of the National Institute of Health, which employs sodium salt solutions to relieve burn shock in mice. Should it prove successful in human cases, Dr. Parran suggested, we may have a substance to alleviate shock which is easier to obtain and administer than plasma, since salts could be given by mouth as well as intravenously.

Vein-Graft Artery Mending

The War Department has approved for use on battle fronts a method of using vein grafts to mend severed arteries and expects it to reduce perhaps by fifty percent amputations of arms and legs of war wounded. Vein banks must be set up in war theaters for storage of blood vessel segments preserved by quick freezing. The new technique involves use of two small metal tubes, usually six millimeters long and one centimetre in diameter, made of vitallium—an alloy with no harmful effects on the body. Segments of veins are inserted in the tubes, the tubes are then inserted into severed arteries, bridging the gap and permitting flow of blood. Normal field technique involves stitching arteries, which is dangerously time-consuming and only 40 percent effective. The new method is said to be much faster and at least twice as effective, even when no-anti-blood clotting agents are used.

Jungle Flying Suit

New flying suits have been approved for British pilots, following pattern developed by one flyer who felt his current equipment insufficient to allow carrying equipment to sustain life in the jungle. The suit is virtually a series of pockets—two breast pockets carry cans of food concentrate; under-arm pockets contain medical supplies; pockets all down the front are for compasses, maps, cigarettes, torch, waterproof matches, water sterilizers, thorn-resisting leather elbow gloves; others provide places for commando knives, and short bayonet. Collapsible pack, into which all the equipment can be stuffed after landing, is carried on pilot's back. Several RAF crews on the Burma front have been issued these new suits.

Port Repair Ship

The Army has unveiled its new harbor repair ship, designed from a merchant vessel, to carry all types of machinery needed for restoring to navigation an enemy-wrecked landing port or an invaded harbor glutted with enemy shipping and debris. The Army plans a small fleet of such vessels, whose need has been evidenced by experience at Bengasi, Tobruk and Naples, where the enemy scuttled vessels, wrecked piers and otherwise sought to render the harbors useless to us. The new port repair ship carries equipment for divers with underwater cutting and welding devices; fire-fighting apparatus; complete forging and tooling plants; a cat-head able to lift 40 tons; four 10-ton booms and one 30-ton boom, each equipped with a power winch; complete 21-unit pontoon system, with 50-ton lifting capacity; high explosives for demolition; and special antibend chambers where divers can be handled hurriedly in the event of enemy attack.

Split-Second Bomb

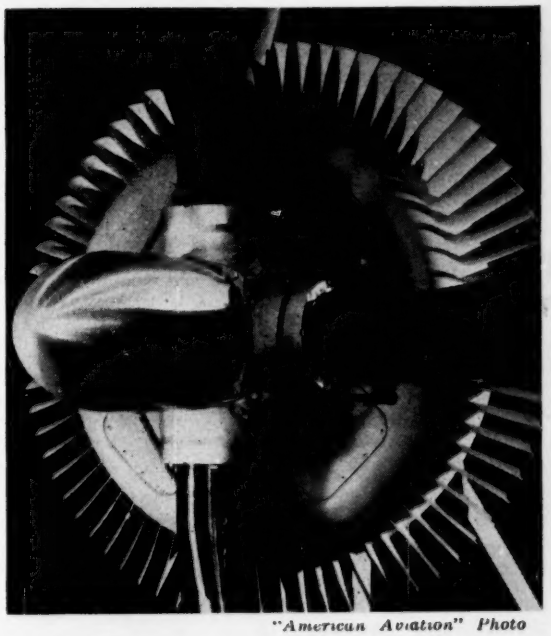
A new bomb which explodes nine ten-thousandths of a second after impact is being used by American airmen, and the ordnance section, Air Service Command, states that fliers can control the explosion down to one ten-thousandth part of a second. The bomb is designed for factory machinery destruction and can be timed to explode in the center of a plant. Mistake of one ten-thousandth of a second in fuse setting could make the difference between successful demolition and merely blowing the roof off an enemy factory.

Mask Research Aids Planes

Research on improved products for construction of gas mask hoses has developed a new, flexible, fire-resisting material composed of fibre and asbestos, coated with synthetic resin, which is highly successful in aircraft heating and ventilating systems and in machine gun equipment. United States Rubber Company scientists discovered the product, which has virtually eliminated all metal from plane heating and ventilating installations, and has made possible a special shell-ejection chute for machine guns and a special air duct to keep bombsights at exact temperatures at all times. Great savings in money, material and time are now possible with the product, since it simplifies plane construction considerably. The flexible hose can be twisted into any shape during installation, and it resumes its designed shape later. Delicate dashboard instruments and aircraft radio work better with the metal eliminated.

Precision Time Firing

New precision time fuses for artillery shells are now ready for combat use after Army field maneuver tests. These are set so each shell will burst split seconds before touching the ground, and require greatest skill on part of gunners as well as absolute uniformity in burning rate of the powder train. This type of shell burst sends, from tree-top height, deadly splinters of hot steel spraying down obliquely into dug-in shelters. It helps offset the Nazi-Jap strategy of lying quietly in slit trenches and fox holes until artillery barrages end and troops pass over. Equally important in the time firing method is that it is now being used, according to observers at recent maneuvers in this country, in close conjunction with tank advances. Our tanks can move into enemy areas, right into the barrage sectors, the time firing can continue, and the tightly-closed, armorplated vehicles can push on through with the barrage. The hail of steel does not harm the steel-clad tanks, allowing close fire on pillboxes and other emplacements while artillery keeps the enemy infantry pinned down.



"American Aviation" Photo

Wright's new engine-cooling fan boosts climb rate 20 percent, improves speed.

Light Generators Float Balloons

One-pound hydrogen generators now furnish lifting power to float sub-stratosphere, weather-recording balloons used by the Army Signal Corps. The balloons can be inflated quickly under battle-field conditions by the new generators, designed by American Can Company's war products division. Adaptable to instant use in any sector where water is available, the light generators replace big hydrogen tanks which had to be trucked to the scene. Companion is a new battery making it possible to fill the plates with acid automatically by placing them in a vacuum, as foods are packed for storage. When the can is punctured, acid is drawn by vacuum into eighteen small holes in the battery.

Nylon Cuts Plane Tire Weight

Nylon cord synthetic tires are now in limited use on heavy bombers, and soon will be made available to the DC-3 commercial airliners, cutting weight of each plane by 50 pounds. Both combat and commercial aircraft can profit thereby—more room for bomb-load and more for pay-load. Commercial lines can increase payloads by 60 pounds per plane and remain within the Civil Aeronautics Board weight limit of 25,200 pounds for take-off. According to Willis Lipscomb, general traffic manager for American Airlines, cargo space is worth $20 a pound a year in peacetime, $100 in war. Recent return of 14 planes to the carriers by the Army, raising domestic airline fleet to 214, coupled with the lighter tires, means a revenue increase of $214,000 gross on the peace-time basis.

Flying Jeep For British

Opposite number of the American "grasshopper" plane, but perhaps with greater maneuverability, is the British flying jeep, a small plane that can whip around trees and climb and dive with startling ability. It is the Auster IV, new model of the all-steel Auster III. Highly mobile, the new craft can take off after run of sixty-five yards, climb 1000 feet in sixty seconds and has speed range from 40 to 130 miles an hour. Single-hop radius of 250 miles with pilot and two passengers is possible under the extreme economy of twenty to twenty-five miles to a gallon of gasoline. The new unit has sound-proof cabin, controlled cabin heating, plastic dome and side windows allowing unrestricted view. Special flaps allows very steep landing dives. Now used for reconnaissance and artillery fire control, as well as light transport (it can haul 450 pounds of freight), the Auster IV is looked for to promote post-war civilian aviation, since the ease with which it can be flown, and its cost ($2,000), put it in class with the newer helicopters.

Remote Control Firing

Strictly unofficial was the emergency-devised remote control firing device contrived by Second Lieutenant Robert T. Krout, Stockton, Calif., when co-piloting a Fortress bomber back from recent European attacks. Lt. Krout attached a copper wire to the left nose gun, ran the wire up through the cockpit and tied a .50-calibre bullet on the end as a handle. Lt. Krout was far from the gun and could not sight it; he simply had to guess and in effect shoot from the hip. A German fighter came up after the Fortress and when the Lieutenant thought it was in range, he pulled his wire, the .50-calibre spouted flame and the Nazi fighter blew up.

Army gun carriage mounts .50 guns, has high speed and cross-country mobility.

"Army Ordnance" Photo

Press Association Photo

Siberian huskies practice bailing out of Army plane to bring aid to crashed fliers.

Fighter Plane Speed

Two Army P-51 Mustangs have shattered all transcontinental speed records, bettering the recent new record of the huge Lockheed Constellation. Colonel Clair Peterson, personal pilot to General Arnold, Army Air Forces chief, set down his Mustang in New York 6 hours, 31 minutes and 30 seconds after leaving Englewood, Calif., and Lieutenant Colonel Jack H. Carter of Pasadena landed his ship eight minutes later. The Constellation had made the overland hop in 6 hours, 58 minutes.

World's Most Powerful Aircraft Engine

A motor rated up to nearly 3000 horsepower has been perfected by Allison Division of General Motors and is being readied for installation in combat planes. The V-3420 is a 24-cylinder, liquid-cooled engine of twice the piston displacement of the present 12-cylinder Allison, now powering the Lockheed Lightning, Mustang P-51, Invader A-36, Airacobra and Warhawk. Mass production is speeded by the fact that 97 per cent of the parts are interchangeable with those of the present Allison, General Motors stated. Thus spares and replacements are already available in air forces depots in all war theaters. The new motor has the design appearance of a "W" instead of the "V" aspect of the present Allison 1710. The new "W" is formed by four banks of six cylinders each, but there is unusually little increase in frontal area compared with the horsepower increase, and also definite drop in weight per horsepower. Not only can the new engine be used in a conventional pursuit plane nacelle, but it is designed also for "burial" installation, permitting it to be used in combination in the largest multi-engined planes. General Motors claims such "buried" installation forecasts ultimate elimination of power plant drag.

Wide World Photo

Bell Aircraft helicopter is so stable it can hover, and gives pilot close control.

Foolproof Parachute . . .

New type of foolproof parachute shortly will be used by Canadian flyers. It is a seat-type affair, with detachable pack, the flyers wearing only the harness outside the plane . . . . Flying Fortresses now have a "ditching" escape ladder giving crews twenty-five per cent greater chance of fast escape when forced down at sea. The narrow, three-step affair is bolted on the radio room door with a swivel bracket and can be swung out in twenty-six seconds . . . Army is trying out music on patients at Walter Reed hospital in Washington, seeking to determine if hearing favorite tunes will help soldiers recover more rapidly from wounds . . . . Giant Army gliders with automatic pilots now are in production at Northwestern Aeronautical Company. Experimental tests at Wright Field, Dayton, Ohio, resulted in Army air force approval of the automatic device, built by Jack and Heinz Company, at Bedford, Ohio. Gliders now can fly in bad weather, since the robot can be set to follow a true course at given altitude, once in the air, and the manual control can be relaxed except for landing or course changes Heretofore, glider pilots had to see the towing plane in order to follow the course.

Glider Crash Skids

Crash skids for gliders, aimed at halting accidents from sudden stops on poor terrain, are in production at Pope Field, N. C. Army Air Base. The skids, approved after flight tests at the Army's Wright Field, Dayton, Ohio, extend beneath the fuselage of the glider and follow the curve of the nose toward the front, preventing nosing over in sand, ditches and wet ground. British engineers are experimenting with creeper treads to facilitate the landing of heavily-laden planes after the war. Development of a practical creeper track tread for heavy aircraft is considered desirable to offset need for super-airports at smaller way points.

Nazi "Super-Planes" Reported

American Mustang pilots report encounters with two new German high-altitude fighters—Focke-Wulf 290 and Messerschmitt 209, claiming the former can run away from a plane pursuing at 400 miles an hour. One Messerschmitt was reported to climb very steeply and fast to 30,000, apparently stall, and then shoot up another 2000 in wide, climbing turns. The new Focke-Wulf is similar to the FW-190, but with a longer nose, seemingly for a different type of engine. The new Messerschmitt seems to be a "souped up" edition of the ME-109. Nazis also claim two jet propulsion planes not yet actually encountered—Messerschmitt Schwalbe and Heinkel. Three new heavy bombers also are reported: Heinkel 178 with four motors mounted in pairs driving two propellers, and with rockets for emergency acceleration; Heinkel 111-Z, said to have five engines, and the Messerschmitt 323, originally a powered glider now converted to a bomber.

Germ Trap for Respiratory Diseases

The Army reports a new "germ-trap" for combating airborne germs causing pneumonia, scarlet fever, sore throat, and other respiratory diseases. The preventive is an odorless, greaseless, non-sticky oil that can be applied to floors, blankets, bedding in hospitals and barracks. It catches and holds bacteria in an invisible film very like fly-paper. Tests covering 16,000 men showed reduction of respiratory ailments by 28 percent by the method. Oiling both floors and blankets trapped 97.2 of air bacteria, the War Department said, and the blankers were made warmer, yet without stickiness, or any fire hazard. The new material includes mineral oil and oleic acid, costs but $6 per barrack on floors and will last for four months; costs two cents a blanket and will last two months.

Army armored car combines auto speed with tank protection. Mounts 37-mm. cannon.

Army Signal Corps Photo

Steel Replaces Brass

Six large American firms, after many months of experiment, have cooperated in perfecting practicable steel-jacketed cartridges for machine gun ammunition, replacing brass should shortages of the alloy become acute. Army ordnance disclosed the development, explaining mass production of the steel jackets may be deferred, since the submarine menace is under control and demands are not so great. Greatest problem in substituting steel for brass was the expansion problem. The combined efforts of the major American firms licked this and other hurdles, and an offshoot of the experiments was automatic feeding of steel strips for blanking operations. This method, should steel cases eventually go into mass output, would save some $5,000,000 a year in the amount of metal required. Navy seabees contrived a new use for Jap antiaircraft shell casings, using the brass jackets to install a 2000-foot drainage system at a Munda hospital. Lieutenant William G. Nichol, USNR, of Albuquerque, N. M., and Lieutenant Walter S. Douglas, USNR, of Forrest Hills, L. I., had the idea when a dump of expended shells was discovered on the island at a time when there was no conventional drainage pipe at hand. Base of each shell was cut off, resulting tubes telescoped and welded together. (The shell case bases were converted into ashtrays for the hospital.)

Water Injection Device

Navy's new water-injection device for giving planes an extra burst of power has been credited with saving pilots' lives in the Pacific. In one instance, Lieutenant (j. g.) Ira C. Kepford, USNR, tailed by three Zeros in a run over Rabaul and only 50 feet off the water, turned the switch controlling the water-injection and shot out of range. The device is being installed in most Corsairs and others using the Pratt and Whitney 2000 horsepower engine. At flick of a switch, the pilot sends a tiny jet of water squirting into the fuel mixture, making the heated engine perform more smoothly and producing a sudden surge of power and speed. It is a refinement of the familiar, improvised injection of water into automobile cylinders on hot days when motors become rough and lose power.

New Fuel Tablet For Army

Army Quartermaster Corps has developed a new type of fuel tablet to enable soldiers in the field to prepare quick, hot meals from K and C rations. Made of a synthetic compound, Trioxane, and colored to show non-edibility, the new tablet betters the square paraffine candle in that it is lighter in weight, heats faster, is more compact, and has less luminous flame. Weighing about an ounce, it will heat a can of English style stew in six or seven minutes.

"Raincoat" Protects Planes

Army Air Service Command is using a special, sprayed-on plastic coating for planes being shipped by vessel to combat areas. The coat, applied within half an hour, turns the ship out like a huge black beetle for deck storage. The coat can be peeled off in 30 minutes, and wings and engines and fuselage are ready for assembly. Brig. General William E. Farthing, commanding the Atlantic Overseas Air Service Command, states his group is still experimenting on better covering to offset salt water damage to shipped aircraft. Hold-carried planes are crated in 35 foot long boxes and are being used by soldiers as living huts in the less exposed field areas.

Marine carries rifle wrapped in Lumarith, waterproof fabric of great strength.

Celanese Celluloid Corp. Photo

Tiny British 3-man sub has no conning tower, much firepower. Submerges 10 feet.

Press Association Photo

Army's new "stratosphere gun fires 120mm shell 20,000 feet higher than any previous weapon. A crew of twelve operates this unusually efficient anti-aircraft weapon.

U. S. Army Pho

Patent New Flying Boat

Retractable seaplane undersurface, allowing smoother streamlining for air flight, has been patented by James F. Parker of Guantanamo Bay, Cuba. Normal undersurface of flying boats is stepped, like a hydroplane, to assist in lift out of water. These steps are inefficient in flight, however, creating air drag. Mr. Parker has designed hinged steps that can be retracted after the plane is in the air, leaving a smooth, comparatively air-free surface.

Buckshot for Small Arms

Chrysler Corporation's Evansville, Ind., plant has turned out 4,000,000 rounds of .45 calibre buckshot shell for use by shipwrecked sailors, stranded fliers, and soldiers in service automatics to kill surface fish, gulls, birds and small animals. The cartridge has a range of 40 feet or thereabouts, and consists of a regular .45 steel case containing a paper capsule holding 135 small lead shot. The paper nose is lacquered bright red and the shells are packed in special cartons labeled to prevent confusion with combat ammunition.

Explosive Rivets Developed

Improved explosive rivets that permit greater speed and uniformity in constructing military aircraft have been perfected by E. I. du Pont de Nemours Co., and Douglas Aircraft Co., now using plastic rivets. The du Pont improvement is expanded from within along its entire shank by an explosive charge, making an exact fit between drilled hole and shank, and eliminating time losses through closely calibrated drillings. The original du Pont explosive rivet was expanded by a charge at end of the shank. It was important when developed two years ago in breaking a bottleneck in plane output. The Douglas rivet, developed at the company's El Segunda, Calif., plant, is a glass-like, center-bored affair, which is inserted in the drilled holes, then expanded with compressed air to lock it into place.

New Havocs Go Into Action

Two new types of the A-20 Havoc light bomber, each able to carry a ton of explosive, are now in action from British bases, the 9th Air Force has announced. One is a bombadier version with transparent nose and the other is an attack type with solid nose and six forward machine guns. The attack ship releases its bombs in synchronization with the glass-nosed plane, which does the aiming.

Speed exceeding 320 miles an hour is claimed. New power-operated turrets with twin .50-calibre machine guns have complete radius of aim. The solid-nose Havoc has nine machine guns, and is the heaviest armed of its type yet produced. Four men operate the bombardier, and three the attack. In the latter, the pilot releases the bombs.

Simplify Hydraulic Controls

Borg-Warner Corporation has announced a "package of power" that simplifies and lightens hydraulic controls on landing gears, wing flaps, and other mechanisms on large warplanes. The eight-pound device combines a reservoir, electric motor, gear pump, relief valve and pressure unit. It cuts the number of units used in plane hydraulic control systems from nine to three. Installed close to the hydraulic cylinder, long lines for transmission of hydraulic power are eliminated and service and operating difficulties minimized. Borg-Warner claims tests show volumetric efficiencies above 90 percent and torque efficiencies above 70 percent. In addition, satisfactory operation at temperatures ranging from 85 below zero to 160 above is claimed for the new unit, which relies on hydraulic loading of the pump's floating bushings for much of its efficiency.

New Type Stretcher . . .

Wheel-barrow type stretchers aimed at easing the carrying of wounded soldiers and permitting one corpsman to perform the work of two, have been patented by a Detroiter. Near forward end is pair of light wheels supporting up to eighty per cent of the load. . . . Canadian war veterans whose hearing has been affected by combat will be provided with the recently developed radionic hearing device of the Radio Corporation of America . . . . Patent has been granted on a visual type radio beacon for use in blind flying, consisting of two radio beam carriers of the double-modulation type whereby patterns are radiated into space on the same carrier frequency. The patterns, heart-shaped, are modulated at different audio frequency so the intersecting space patterns provide two radio beacon courses . . . . Civil Aeronautics Administration has developed a 5,000,000 candlepower beacon which moves up and down at rate of 23 complete cycles a minute, distinguishing it from all other lights in an airport neighborhood and enabling pilots to see it from any angle . . . . National Inventors Council of the Commerce Department has called on inventors and the public to send in ideas for the protection of soldiers from flame-throwers. Also sought are additional tank fire-control apparatus; life vest that inflates automatically and turns wearer over on back; gas mask through which voice is clearly

Army's new waterproof battle uniform has drawstring trousers, other comfort features.

U. S. Army Photo

audible; optical method of distinguishing between natural and artificial green, and a coating for glass surfaces to cut glare.

Green Runways . . .

Australian air department states that the Japanese are dispersing their key points and camouflaging them more elaborately in an effort to offset the continuing wave of allied bombing. Enemy runways are now sprayed green and supplies and equipment carefully secreted under jungle foliage . . . . . The Navy disclosed a hitherto secret camera by which pictures may be taken through the periscope of a submerged submarine, giving accurate record of hits and sinkings of enemy shipping . . . . Soldiers, sailors and Marines blinded by warfare will be provided seeing-eye dogs as life companions if they desire, the government has provided through legislation recently signed by the President. Veterans Administration is authorized to provide the dogs free . . . . University of Michigan scientists have invented a delicate instrument able to gauge thickness of metals through sound waves. It embodies the principle used in charting sea courses by recording echoes of ocean bottom variations. It is known as the "supersonic reflectoscope" and shoots out sound waves and records their movements as the device passes over metal. It is useful in detecting flaws in metal castings . . . . First regularly scheduled commercial television relay system has been inaugurated between New York and Philadelphia. The link will operate each Monday night.

Finding Metal In Flesh

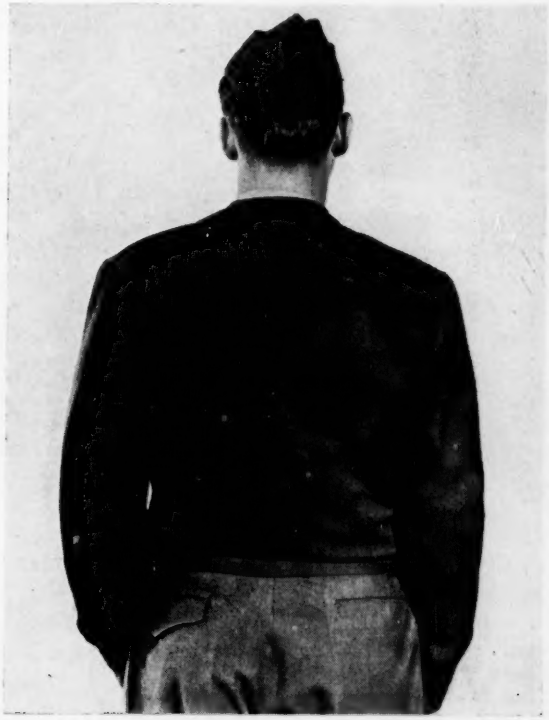
Samuel Berman, test engineer for the New York City Transit System, has developed a device which locates metal in human flesh and signifies the fact by sounding a siren. It also discloses the direction along which the metal splinter lies. . . . Army ordnance experts are claiming the Nazi so-called secret weapon—Goliath, radio-controlled, explosive-laden tank—is only a poor imitation of a weapon this country discarded nine years ago. . . . Long research into effect of high altitude on the human body is claimed to have proven that pilots suffering decompression sickness aloft are not subject to sudden death from nitrogen bubble in the brain. Dr. Joseph P. Webb, instructor in medicine at University of Cincinnati, offered the report for himself and several colleagues, stating that nowhere was it proved possible to demonstrate nitrogen bubbles in venous blood during attacks of aviator's bends . . . . Bendix Aviation Corporation has begun production of a midget aircraft starter for cranking aircraft engines. It weighs only 32 pounds, and is spun by an electric motor to speed of 28,000 rpm, with 1200 foot-pounds of punch.—Edited by Corporal Ray Moulden.

Yanks in European theater will get wool serge field jacket patterned after British.

U. S. Army Photo

Jacket has four pockets, convertible collar, is twill lined. Used for dress or combat.

U. S. Army Photo



Official Coast Guard Photo

Swift Evacuation

Men wounded in the invasion of Makin Island are transferred to a waiting Navy hospital plane by a Coast Guard transport. The Coast Guard administers first aid en route to plane.

Aviation

Reports and Comments on the Military Uses of Aircraft

IN THE air and on land, Marines have fought it out with the Japs in the Pacific as a team. Since the early days of Guadalcanal they have known whether in the air or on land they are fighting arm in arm.

At the battle of the Tenaru River on Guadalcanal, infantry repulsed stubborn enemy atempts to retake Henderson airfield, and as the enemy retreated, battered and disorganized, Marine dive-bombers swept down on them, bombing and strafing, as Japs sought cover in a coconut plantation. Again, at Grassy Knoll the dive-bombers hit the Japs, this time knocking out enemy artillery harassing Marine ground troops. During the fight of Grassy Knoll, these same Marine planes served as spotters for Marine artillery units, and in unison Jap strongholds were bombed and shelled.

Marine dive-bombers continually bombed and strafed resisting Jap positions during the all-out Allied offensive at the Matanikau River from November 1st to 10th, and paved the way for the ground units which fought through the dense, steaming Guadalcanal jungles. Thousands upon thousands of Jap soldiers, arriving as reinforcements for the Guadalcanal garrison, never reached their destination as Marine dive-bombers and torpedo bombers sank their transports in the Solomon waters. Five of these transports were beached along the coastline north of Lunga beach.

Air Support from Island-to-Island

As the struggle for the Solomons moved northward to the New Georgia islands, the importance of closer air-ground teamwork in island-to-island warfare became increasingly evident. For the first time, an aviation command went ashore with the landing troops at Rendova and directed the fighter umbrella maintained over the New Georgia area until Jap built Munda airdrome was captured. Air-liaison officers, who were dive-bomber pilots at Guadalcanal, went ashore with infantry units and were responsible for air support requests. Colonel Liversedge's Marine Raiders in the Biaroko-Enogai area, holding a road-block and cutting off Jap supplies from Kolombangara, were dropped jungle rations from transport planes. Constant air support was given to the Raiders and to Army troops closing in on pillbox-studded Munda airfield.

The siege of Munda came to a climax when one of the biggest air attacks in that area preceded the final assault on the airdrome. First, the Jap positions were pattern-bombed by heavy and medium bombers and then the torpedo and dive-bombers dove in to knock out pin-point targets. The difficulty of hitting pill-boxes and gun positions in dense jungles forced torpedo and dive-bomber pilots to fly extremely low, bringing them within range of enemy small arms fire. On two occasions, over a period of less than a week, the torpedo bomber spotting plane was shot down by enemy AA fire. The entire crew, however, was rescued each time.

Mutual Confidence Between Air and Ground

Air superiority and a continual air umbrella intercepted and prevented Jap air attacks on ground installations. Only when the Jap dive-bombers sneaked through did the ground troops open up with anti-aircraft fire. The confidence airmen and groundmen had in each other was obvious.

A terrific dog-fight was raging over Rendova one day in July, when a Marine flyer came speeding out of a low cloud with a Jap Zero hot on his tail. The Marine airman was in trouble, but as he swooped over the Rendova beaches anti-aircraft men realized his difficulty and opened up on the Jap. They did not down him, but the fire was so heavy the enemy was forced to veer off his course and the Marine escaped into a cloud.

The complete success of an air command going ashore with infantry troops prior to the capturing or building of an airfield during the New Georgia campaign was responsible for similar assignments in later operations. Major General Francis P. Mulcahy, USMC, veteran of the last war and Guadalcanal, had the initial assignment, which included the responsibility of maintaining the air umbrella over the Rendova-Munda area for more than a month, followed by the operating of the first Allied aircraft to fly from the Munda airfield.

Brigadier General Field Harris, USMC, who earlier in the year had commanded aircraft at Guadalcanal, joined the First Marine Amphibious Corps in the attack on Bougainville. His staff was responsible for the umbrella over the beachhead until an airfield was hacked from the jungle.

Aboard a ship heading toward the landing Lieutenant Colonel Alan Shapley, of San Francisco, said to Marine Raiders:

". . . We are going to land on what we shall call Beach Green-2 on the island of Bougainville. This beach is on Empress Augusta Bay. . . . We are going to drive in and seize a beachhead by destroying any and all Japanese that oppose us. We are going to enlarge this beachhead. Then we are going to hold this area, come hell and high water, while a vital airfield is built. . . .

". . . There will be Marines to the right of you, to the left of you, and four days after we land many more Marines will come in behind us. Even in the air above you will be Marine planes. . . ."

Marines in the air had pounded the Jap airfields on the southern tip of Bougainville day and night. The two main enemy airdromes in this area, Kahili and Ballale, were knocked out of commission. The landing on Empress Augusta Bay was softened up by a terrific Naval barrage, followed by aerial bombardment. Groups of torpedo bombers first descended on Cape Torokina, pounding Jap pill-boxes with two-thousand pound bombs. Dive-bombers hit other installations along the beach and others strafed position with a comb of fifty and thirty caliber machine gun fire. High in the skies over the convoy, fighter planes were circling at various altitudes, anticipating a possible attack on shipping and landing parties by enemy aircraft. Soon after the landing, enemy aircraft were on the scene. Three Jap torpedo bombers were the first to get through to the beachhead. They swept in to hit Marines along the beach.

Torokino Dog-fight

A Marine described the situation as follows:

"We are waiting on the open beach when we spot the first Jap planes of the day. I see three of them, torpedo bombers with their fixed landing gears. They hurtle out over the bay area, evidently heading for our ships, which are anchored some distance out. Our destroyers closest to the shore get their guns in action instantly. A dirty, black puff of smoke suddenly bursts out laterally from the engine of one Jap. In a moment both of its wings and the underside of its fuselage are ringed with streaming banners of bright orange flame. The stricken plane careens wildly toward Puruata Island and then begins climbing skyward in fiery agony. It is a fascinating thing to watch. . . .

"In one and the same instant I hear the electrifying sound of a diving plane and experience a flash of fear for my life. I am less than five yards from the wall of jungle growth which borders the beach where I am standing. The men all around me are diving into the undergrowth. . . . I trip and fall flat on my face. The whole world is filled with the terrifying noise of the approaching plane. I can distinctly hear the staccato bursts of the strafing machine guns, coming closer every second. I lie where I fall. . . . In a moment we know the source of our salvation. Still prostrate, we hear the sound now, not of one, but of two planes. One of our guys is after the bastard. Because of the solid jungle roof, we cannot see anything above us. We follow the ensuing dog-fight by listening to the inter-zooming plane engines. They are clearly distinguishable from one another; the Jap is soprano; ours is bass. The dog-fight moves out over the bay. Later we learn that Tojo was shot down."

Shoulder to Shoulder Against Japan

But of the many experiences learned on Bougainville, the necessity of air-ground teamwork became evident at Hellzapoppin Ridge. The fight for this crooked, razor-back ridge made it finally clear that aerial bombardment was of great value in jungle warfare. Although this ridge was only 250 feet high, it dropped away almost vertically on either side, making approaches to the top extremely difficult. The crest averaged only forty yards across, and the whole of this was a matted, wild tangle of jungle and giant trees. The first attempts Marines made to capture the ridge were repulsed, and it was then that the difficulty of capturing the crest was realized. The enemy was well dug in, and his positions were the hardest type to knock out—foxholes dug straight down with only enough room to stand in. They presented but a tiny target for artillery fire or planes. On November 18th, Marine dive-bombers roared off the newly constructed Torokina airstrip to plaster Hellzapoppin Ridge. It was this attack that broke the Jap's back. It was close-in bombing, as Marines were holding ground within a hundred yards of where the bombs were falling. Seconds after the last plane had dropped its deadly cargo, ground units rushed the Jap's last positions on the ridge, using flame-throwers to burn out the only two dugouts still returning fire.

That afternoon the flyers talked at great length with the line troops. Later, both groups said of one another: "Those guys certainly are great."

The struggle of the Solomons made clear the necessity of air-ground teamwork and proved that Marines in the air and on the ground must fight shoulder to shoulder to defeat Japan.—Captain Charles Mathieu, Jr., USMC.

GETTING GROGGY

United Press Dispatch received in Washington: A Japanese spokesman said today that Japan was "doing everything in its power" fo walwalbalbalbalbalbalbalbalbal.

The New Yorker: The Marines have landed.

BACKGROUND

Young Yugoslavia

In Yugoslavia, the Germans are making a full-scale effort to crush the Partisans (and so safeguard the railway linking Austria, via Zagreb and Belgrade, with Bulgaria and Rumania) and also to protect the Dalmatian coast from possible Allied invasion. Fierce fighting is going on in Bosnia. The Germans are faced by an army of Partisans, under Marshal Tito, comprising some 300,000 men and women highly trained in a new technique of war. The story of what happened during what the Partisans describe as the "sixth general offensive against liberated areas" explains the dilemma in which the Germans are placed.

When the collapse of Italy threw on to the German army the additional burden of providing some twenty divisions to garrison the Balkans, and it became obvious that Germany in the summer of 1944 would have to fight major campaigns on three fronts, orders were issued that during the winter of 1943-1944, General Rendulic and the Second Panzer Army must crush Tito's forces so that the German occupying troops could be reduced to a mere handful supporting the Croat and Bulgarian garrison troops in eastern Serbia.

It is impossible to trace in detail the course of the ensuing campaign but, in general terms, the series of offensive operations spread over six months led to an indecisive result and left the situation pretty much as before. German armored columns would thrust through a particular area, capturing most of the towns, while the Partisans withdrew to mountains into which the Germans were unable to penetrate. The latter found that they controlled only the territory they stood on, for the Partisans would close in on them from behind. Small German garrisons were mopped up and larger ones left in unhappy isolation.

Partisans Mount in Strength

The Second Panzer Army has suffered heavy casualties, and all that General Rendulic can claim is that he has managed to hold the coast open from Fiume down to Albania, and to keep a few heavily-escorted trains running between Trieste and Belgrade and down to the coast of Dubrovnik. On the other hand, instead of being weakened in strength, the numbers of the Partisan forces are steadily mounting; and as they receive supplies from the Allies by air they are becoming increasingly aggressive. They now control rather more than half of all Yugoslavia. By great efforts the Germans have been able to retain their hold on the Dalmatian coast and to regain many of the neighboring islands; but their lines of supply back to Fiume and Zagreb are precarious, and the Allied navy is making it increasingly dangerous for them to send supplies by sea.

If Marshal Tito neutralizes the German drive—as he has done on previous occasions—and can then open a corridor through to the coast so that he can receive Allied supplies in bulk by sea, he has an excellent prospect of expelling the enemy from Yugoslavia and cutting the vital lines of communication between the Balkans and Germany. That does not take into account the possibility of the landing of an Allied army.

The spirit animating the Partisan movement and its National Army of Liberation has been vividly portrayed by correspondents representing the combined British and American press who have recently reached Marshal Tito's headquarters in the Yugoslav mountains. One of them, describing the Congress for Youth, writes:

Promise of Democracy

"There were more than 800 delegates representing the youth organizations of more than 500,000 registered members. Almost half of them were young men and women in the fighting forces. They are the spine of Tito's army and seventy-five per cent of them are not more than twenty-five years old. There were long speeches and longer resolutions, but all their faces were serious. They took an oath to Tito, pledging their lives and their honor in the struggle for liberation, and they meant it. Many of the delegates were veteran fighters. Many had travelled for weeks on foot to attend the Congress. Some had forded rivers and fought their way through enemy lines. Some had left behind their dead comrades. They stood and applauded the names of Churchill, Roosevelt and Stalin. They shouted against traitors, not mentioning any names. They cried out that there would be no return to the old state of things."

The main resolutions that were passed were; first, to forge a stronger link between the youth organizations throughout the country in order to intensify the war effort both at the front and behind the lines; and second, to do everything possible to assist in organizing a federated Yugoslavia on democratic lines. Difficult political problems lie ahead, but the spirit of fighting democracy evinced by these young Yugoslavs of both sexes, representing all racial elements of the country, is surely a sign of the new Europe that is to come out of the agony of this generation.

Enough Men for the Job

A new system of casualty replacements that is giving sustained drive to the 5th Army in Italy indicates the methods by which General Dwight D. Eisenhower may be expected to keep Allied invasion forces rolling, regardless of losses.

Secretary Stimson recently revealed that battle-thinned ranks of a division or unit are refilled daily with fresh and energetic troops. It has been called a "needling" process, or similar to the "substitution" process which football coaches use to relieve exhausted players—when they have adequate reserves. Lieutenant General Jacob L. Devers, commander of all United States forces in the North African theater—which includes Italy—has credited such use of casualty replacements as being responsible for the sustained sixty-mile drive of the 5th Army in fourteen days of fighting northward from the Anzio beachhead.

The new method of replacement could not have been used earlier, according to officials, because now for the first time in Italy there are enough well-trained replacement divisions from which to draw men for the front lines. The system is new to our Army only in its application. Secretary Stimson has stated: "This represents a demonstration of the importance of the efforts to obtain for our Army young and vigorous replacements which the War Department has emphasized so strongly."

The new method differs radically from the replacements procedures used by General John J. Pershing in the AEF of 1918, during the period of mounting casualties from Chateau Thierry to the end of the Meuse-Argonne offensives. Then, a complete division was usually replaced by another complete division. An example is the instance of the 2d Division which, with the 1st Division and the 1st Moroccan Division, spearheaded the Allied surprise offensive at Soissons. In two days the 2d Division sustained losses of 3,500 men killed and wounded, having entered the front lines after a grueling forced march. It captured its objective, but the division was out on its feet.

Old vs. New Methods

A fresh division filtered through its lines to relieve it, while units of the 2d Division withdrew to the rear for rest and reorganization. Under the new method, the exhausted ranks of the 2d Division would have been invigorated by fresh troops during the day or night, and the men still remaining fit for combat would have carried on.

"What has been done in Italy can be done after an invasion takes place," an official has explained. Replacing airborne casualties may perhaps entail a different and more difficult method than any used for bolstering an infantry division or artillery unit. If it is possible to land reinforcements at or near a seized airfield, troop-carrying planes bringing up replacements can evacuate the casualties.

Unified Command

In Washington and wherever else American officers congregate, there have been frequent discussions in recent months over suggestions for unifying the commands of the Army and Navy. The Army, generally, has been all for it. The Navy, generally, has been inclined to be cool.

Congress and the Press have added considerable wordage to the discussion, the weight of their opinions lying as a rule in the direction of waiting until after the war for any action along the lines of consolidation. Senator Hill of Alabama introduced a bill which would give the Army, Navy, and Air Forces co-equal status in a single "Department of Armed Forces," consolidation to take place six months after the war. But Representative Woodrum of Virginia, chairman of the House Post-War Military Committee, which had been hearing all sides of the controversy, said: "I feel confident that the House will not favor rushing into a revolutionary reorganization of the Army and Navy at this very critical hour in our military operations."

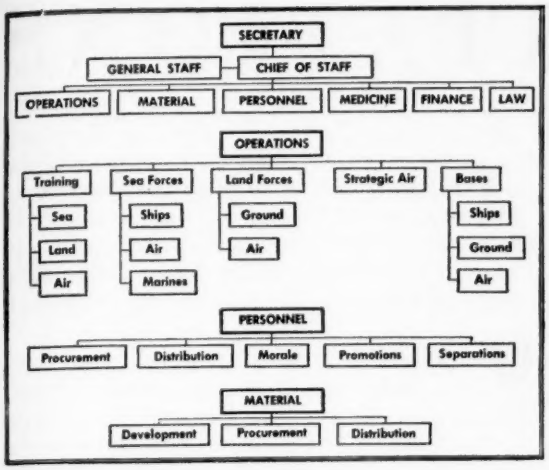
Newspapers Urge Caution

The Twohey Analysis of Newspaper Opinion reported that forty per cent of newspapers commenting on the problem urge immediate consolidation. The remaining discussion takes a more reserved tone, approving closer coordination but urging further study or advising that action be delayed until after the war. Typical of newspaper divergences were the attitudes of the San Francisco *News* and the Chicago *Daily News*. The San Francisco paper said:

"The advocacy by Secretary Stimson and various leading generals of a merger of the armed services into a single Cabinet department has now been drenched with cold water by the testimony of Secretary of the Navy Forrestal. Mr. Forrestal wants to wait and see. He is afraid that the product of such a consolidation might be too big for efficient operation. He favors further study rather than action now, even action which would only authorize a merger after the war is over. We are sorry to see the Navy thus hewing to tradition."

The Chicago *Daily News* said: "Before we endorse the proposal to lump the Army, Navy, and Air Force together in a single Department of National Defense, we would like to hear more argument and see more evidence. What would be the advantage? Are we not doing pretty well as it is? Is anything really lost by a healthy Army-Navy rivalry? And are not the services already sufficiently unified in the person of the President, who is also the Commander-in-Chief?

Lieutenant General Somervell presented twenty-eight pages of testimony, and Under Secretary of War Patterson twenty-three, to support the argument that there is overlapping and duplication



Suggested plan for unified command. The Marines would remain in the sea forces, and the Navy would retain its air arm.

in the Army and Navy now, and that there is friction between the two branches.

The navy's response to these arguments took this line: The war is progressing satisfactorily—that is the real test of the efficiency of the armed services. Some things look good on paper that have defects when put into practice. A single department might be unwieldy. Wasteful friction between the services has already been eliminated to a great extent by closer liaison. Within limits, competition between the branches is healthy.

Assistant Secretary of the Navy Gates said he was for consolidation—provided the Army was consolidated into the Navy. Before the House Committee on Post-War Military Policy, he said, "Consider that after the war we will have the largest navy the world has ever known. With it, we will have the Naval Air Force and the Marines, together with many years experience in the conduct of two-dimensional warfare, and with the machinery for the common procurement of materials, supplies, bases, etc., already well developed and functioning. It can operate on sea, under the sea, in the air, in amphibious operations, and on land. This force by itself can police the world."

Lieutenant General Vandegrift, Commandant of the Marine Corps, told the same committee: "I believe that the elements of tradition and *esprit de corps* should be considered in any suggested change of organization. During over 168 years, traditions have been built up which have been passed on to nearly half a million Marines during this war. We can envision no gain to our country's readiness for war in any reorganization which would discard a tradition and an *esprit* as old as our nation and which have become inspiring parts of the heritage of our people.

"Certainly, at this time, we can see no evidence that so much of this war as has been conducted by our Navy indicates any urgent necessity for a drastic change in over-all organization of our armed forces. . . .

"In time of peace, the American public measures military economy on a dollars per man basis. In war, they measure it purely on a basis of comparative results."

The Detroit *News* tellingly approved General Vandegrift's statement. It said: "It is well known in the Marine Corps that a Marine is something special. After ten days of boot training, a Marine knows he can lick any five ordinary men. On the eleventh day, he is quietly and confidently ready to prove it to any doubter. That is what is called morale, and it is a military asset of tremendous, if imponderable, value."

Americans Under Arms

Over 5,200,000 Americans of the Army, Navy, Marine Corps, and the Coast Guard are overseas or on duty afloat. Secretary of War Henry L. Stimson revealed recently that there are 3,637,000 soldiers deployed overseas. According to Navy sources, there were 1,566,000 members of the Navy, Marine Corps, and Coast Guard abroad or at sea on April first. In "transit status" or in training for foreign or ship assignment were 900,000 more, while 811,000 of Navy, Marine, and Coast Guard personnel were on duty in this country.

The Army Air Forces has 75,000 planes, of which 34,000 are combat aircraft. It operates 925 bases on foreign soil, of which about 750 are airfields. The AAF has more than 200 heavy bombardment, medium bombardment, fighter, and reconnaissance groups, nearly all committed to overseas duty or continental defense.

By the end of the year, the services together will have a total of more than 7,466,000 Americans on foreign fronts or aboard warships.

MARINE CITATIONS

NAVY CROSS

BURGESS, WILBUR, 1ST SERGEANT, (Baltimore): Helped destroy two enemy pillboxes and then took command of his company in the general attack against enemy defenses after all its officers had been killed or wounded. (Tarawa)

MALANOWSKI, ANTHONY P., JR., PLT. SERGEANT, (Baltimore): Sgt. Malanowski, in the face of heavy machine gun, rifle and mortar fire, covered the withdrawal of his company, and inflicted severe losses on the Japanese, until he was overrun and killed by the enemy. (Guadalcanal)

MARTIN, GLEN E., CAPTAIN, (Colorado Springs, Colo.): On Perry Island in the Marshalls a Jap pillbox, about 35 yards inland, imperilled the Marine advance. Capt. Martin ran up and threw hand grenades into the emplacement. When enemy fire continued from the position, Capt. Martin personally led an armored vehicle to the danger point where its guns blasted the concrete dugout to bits. When the first wave landed on Perry the flank of Capt. Martin's unit was exposed to machine gun fire from the pier on his right. His men had no time to investigate. Realizing the danger, Capt. Martin reconnoitered the pier, spotting a Jap gun. Again exposing himself to Jap fire, he pointed out the target to an anti-tank crew which soon destroyed the Jap gun.

LEGION OF MERIT

BREWER, JAMES H., LT. COLONEL, (Rochester, N. Y.): By his assistance in the training of personnel and in supervising the loading of landing craft for the amphibious assault in the Gulf of Salerno, Lt. Col. Brewer contributed essentially to the expeditious procedure of beaching and unloading.

BROWN, WILLIAM F., COLONEL, (Chestertown, Md.): Assistant chief of staff in charge of supply for the Fourth Marine Division. Gilbert and Marshall Islands Campaign.

EDSON, MERRITT A., BRIG. GENERAL, (Washington, D. C. and Chester, Vt.): For his part in planning the successful attack on Tarawa.

KATZENBACH, EDWARD L., CAPTAIN, (Morristown, N. J.): He landed with only half of his reconnaissance company on islands of the Eniwetok atoll, Marshall Islands, and cut off escape of Japanese forces from the larger garrison islands. Capt. Katzenbach's men captured a total of 19 small islands.

ROGERS, WILLIAM W., COLONEL, (Oxford, Ohio): Chief of staff in the Fourth Marine Division, he played an important part in planning the attack on Roi-Namur in the Marshall Islands.

WENSINGER, WALTER W., COLONEL, (Fremont, Ohio): He was assistant chief of staff in charge of operations for the Fourth Marine division. (Gilbert and Marshall Islands campaign)

SILVER STAR

BERTSCHE, DONALD L., PFC., (Newport, Ky.): PFC. Bertsche threw hand grenades and delivered rifle fire at hostile emplacements until he had contributed materially to the advance of his platoon.

Arriving near enemy lines at a point under heavy fire from mortars, grenades and machine guns, he observed a Japanese soldier taking aim at a Marine. Rising from his position, he exposed himself just long enough to destroy the enemy, but in so doing was struck in the chest and killed by a hostile bullet.

BOWNES, HUGH H., LIEUTENANT, (New York city): Lt. Bownes voluntarily remained in Japanese-occupied territory for three days for the purpose of securing vital information with regard to terrain, hydrographic conditions and strength and disposition of hostile forces and successfully carried out this important assignment.

BYFIELD, WILLIAM G., SERGEANT, (San Diego, Calif.): Chose to remain with a group of wounded Marines when surrounded by enemy forces during the Marshalls fighting.

CONOLEY, ODELL M., LT. COLONEL, (Amarillo, Tex.): Although exposed to fire, he so directed and controlled the fire of his battalion that repeated and determined counterattacks, both day and night, were repulsed with heavy losses to the enemy. His tireless devotion to duty, leadership and cool judgment under fire were an inspiration to his men and were largely responsible for preventing hostile penetration of our lines. His battalion kept continuous pressure and advanced 3000 yards. (New Britain)

DICKEY, HOWARD C., SERGEANT, (Enhaut, Pa.): Led a platoon in a frontal attack on Japanese positions in the Roi-Namur battle.

DOWNEY, EDWARD J., JR., PRIVATE, (Ossining, N. Y.): Risked his life to swim between two small islands in the Kwajalein atoll to carry an important message to his battalion commander.

LUINSTRA, TIN F., SERGEANT, (Laverne, Okla.): He moved against a number of the enemy, who had succeeded in penetrating his company's lines during the night, and destroyed them with an automatic rifle, saving the lives of many of his comrades. (Tarawa)

MAXWELL, RICHARD E., PFC., (Kansas City): During an attempt to dislodge the enemy who had landed between our forces and the Laruma River (Bougainville), PFC. Maxwell's company was held up by fierce Japanese fire. Fully aware of the extreme danger, he courageously volunteered to destroy the hostile machine gun nest and, moving forward alone, threw three hand grenades into the enemy emplacement, silencing the gun. (Awarded posthumously)

MCAVOY, GEORGE B., CORPORAL, (Baltimore): When a strong Japanese attack broke through a portion of a Raider Battalion's position at the mouth of Matanikau River (Guadalcanal), Corp. McAvoy worked his way back into an area overridden with enemy troops and, under hostile fire, dragged a wounded comrade to the safety of his company's reformed lines.

MCVAY, BREATHITT R., PL. SERGEANT, (Anaconda, Mont.): Sgt. McVay, being without hand grenades when his platoon was held up by Japanese fire from a concrete emplacement, fully exposed himself in order to wipe out the enemy by direct fire. Later, he again exposed himself with other Marines to destroy some Japanese who were firing on his platoon from the rear of an emplacement. (Tarawa)

O'NEILL, JOHN W., CAPTAIN, (New York City): Establishing a combat outpost in advance of his battalion's front lines (Battle of Piva Forks, Bougainville Island), Capt. O'Neill and his men destroyed 30 Japanese and obtained enemy orders and maps of great value. Participating in an attack by his battalion against a strongly entrenched hostile position, Capt. O'Neill unhesitatingly advanced alone in full view of the enemy in order to reconnoiter the Japanese position. Coolly returning to his men, he ordered an attack which destroyed the enemy but he was mortally wounded while leading the assault.

PRUSICK, ALFRED A., 1ST LIEUTENANT, (Greenfield, Mass.): Killed a Japanese officer with his bayonet, rather than risk firing into his own men, after the enemy had slashed a Marine with his saber.

REDISKE, HAROLD R., PFC., (Rygate, Montana): Repeatedly exposed himself to enemy fire to rescue wounded Marines although himself painfully wounded.

STEARNS, EARL J., CAPTAIN, (Decatur Mich.): Capt. Stearns set up his machine guns in an extremely open position during an attack and successfully neutralized the fire of heavily-armed Japanese gun emplacements that had been blasting away at the advancing Marines at Tarawa.

STEVENS, WENDELL T., CORPORAL, (Miller City, Ill.): Serving as a member of the five-man crew of a 75-mm anti-tank gun (on Puruata Island, British Solomons) Corp. Stevens unhesitatingly advanced into the jungle to assist in reducing an enemy position. Although seriously wounded he continued to keep his gun in action until the hostile stronghold was destroyed.

WALKER, JAMES M., CAPTAIN, (Pasadena, Cal.): Arriving at Henderson Field, Guadalcanal, with a cargo of emergency supplies for troops at that point, Capt. Walker courageously remained at his post, supervising the loading of the wounded during bombing and strafing of the field by Japanese bombers and fighter planes. While taking off with 14 seriously wounded men, he was attacked by four enemy fighters. Although without armament, Capt. Walker succeeded in avoiding the enemy until Navy fighter planes could come to his rescue.

WILSON, HERVE, SERGEANT, (El Dorado, Ark.): Though painfully wounded in one leg during an advance toward enemy entrenchments, Sgt. Wilson refused to be evacuated and continued to fight with his platoon through a withering hail of fire until he was mortally wounded by a second shell.

AIR MEDAL

ARNDT, AUGUSTUS L., CAPTAIN, (Newton, N. C.): On a daylight bombing mission against enemy shipping in the harbor of Kahili, Bougainville Island, Capt. Arndt scored a direct and fatal hit on a Japanese cargo vessel.

BROWN, ROBERT O., CAPTAIN, (Winfield, Kans.): Leading his division on a daylight bombing mission at Kahili, Bougainville Island, Capt. Brown fought his way through hostile fighter interception and anti-aircraft fire and scored a direct and fatal hit on the starboard beam of a Japanese cargo vessel.

COSLEY, JACK, CAPTAIN, (Hood River, Ore.): On a daylight bombing mission against hostile shipping at Kahili, Bougainville Island, Capt. Cosley scored a direct and fatal hit on the stern of a Japanese cargo vessel.

CUMMINGS, DANIEL L., CAPTAIN, (Maison, Ill.): During the prolonged period of December 25, 1942, to September 5, 1943, in the Solomon Islands area Capt. Cummings flew on numerous routine anti-submarine patrols, searches, task force covers and single sorties over enemy-held territory in the face of intense anti-aircraft fire, and contributed materially to the success of our forces in defending our positions in this area.

HAYS, JOHN E., CAPTAIN, (Bakersfield, Cal.): Capt. Hays flew regular patrols, searches, and task force covers, and successfully completed numerous dive-bombing attacks against enemy shipping and strongly fortified shore installations, despite heavy anti-aircraft fire and fighter opposition. (Solomon Island area)

JOHNSON, JAMES E., CAPTAIN, (Kirkwood, Mo.): Returning from a successful strike against enemy shipping in the Shortland-Kahili area Capt. Johnson began a strafing run on enemy anti-aircraft installations endangering our bombers, and blasted a Japanese bi-plane from the sky. While leading a flight of six fighters in an air battle near the Russell Islands in a badly damaged plane, he shot down an enemy fighter.

JONES, ALBERT L., CAPTAIN, (Marshall, Mo.): During a prolonged period of air operations in the Solomon Islands area, Capt. Jones skillfully flew on numerous routine patrols, searches, task force covers and single sorties over enemy-held territory in the face of intense anti-aircraft fire.

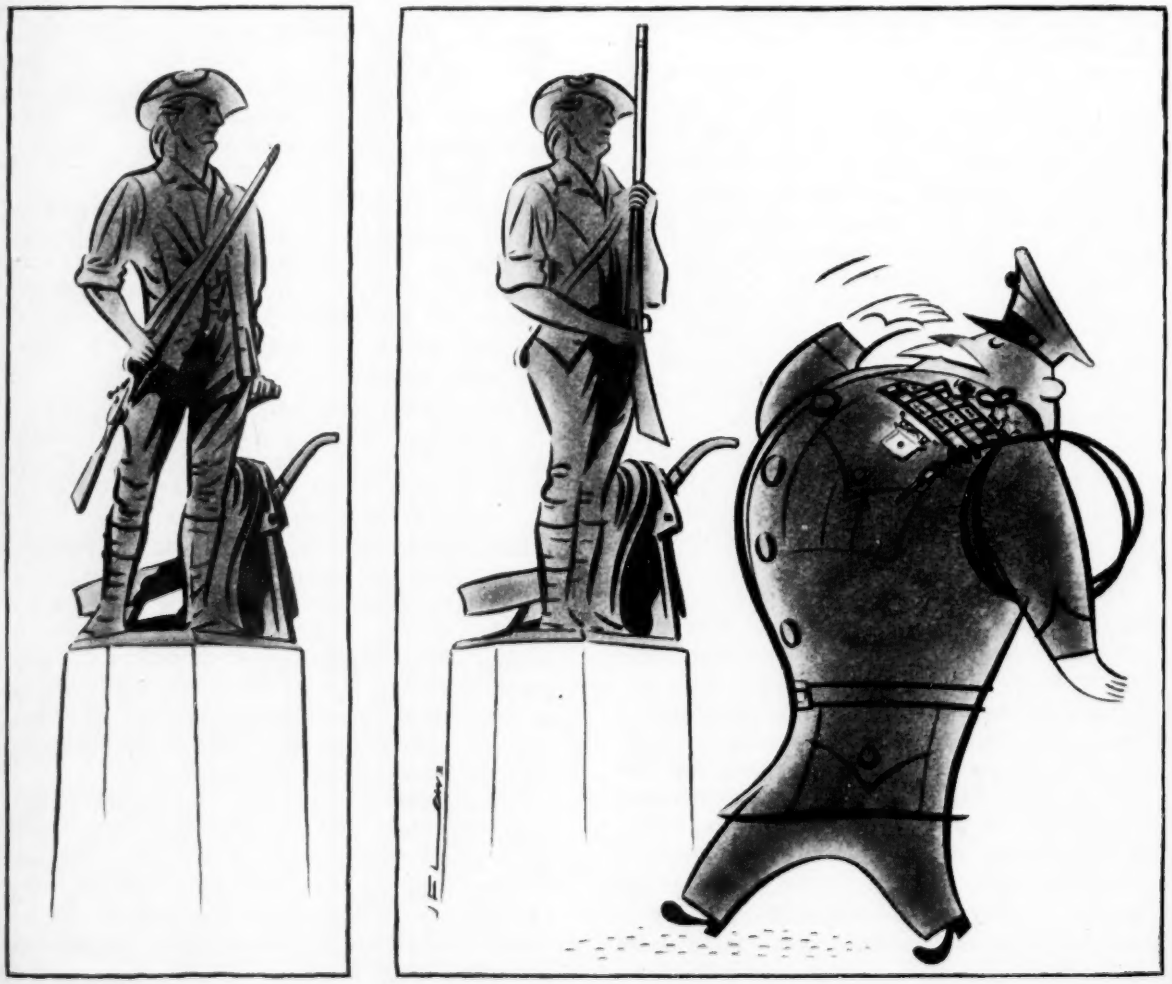
SPRADLING, WILLIAM C., 1ST LIEUTENANT, (Hollis, Okla.): Under handicap of adverse weather conditions which required precise navigation at dangerously low altitude, Lt. Spradling ran a gauntlet of blinding searchlights and bursting shells in order to lay aerial mines in the waters south of Bougainville Island. Later, in a raid on the airfield at Kahili he inflicted serious damage on the enemy, leaving revetment and bivouac areas ablaze. When his plane hit by anti-aircraft fire during a striking mission over Munda a few weeks afterward he successfully released his bomb, then crashed in flames on the airfield runway. He gallantly gave his life for his country.

TRENCHARD, HAROLD R., CAPTAIN, (Laguna Beach, Cal.): When his flight of eight fighters intercepted a superior force of enemy Japanese bombers and Zeros heading toward our installation on Rendova Island, Capt. Trenchard launched an immediate attack and sent two hostile fighters crashing into the sea.

On July 2, when his flight again encountered a large enemy force in this vicinity, he shot down one Zero in flames; and later in a similar engagement personally accounted for still another enemy fighter. (Capt. Trenchard was killed on March 8, 1944, in a plane crash in the South Pacific.)

The General

By LOWE



OFFICIAL INFORMATION

Digest of Announcements from Official Sources

Aviation Appointments Open

Aviation warrant officers are now eligible for appointments as Second Lieutenants for aviation ground duty. This is in modification of Letter of Instruction No. 673 which provides for commissions for enlisted personnel of the Corps who have experience in aerology, transportation, maintenance, fight control, chemical warfare, communications and ordnance.

All aviation specialties of warrant officers and enlisted men will now be given consideration.

Applications of warrant officers shall include the data required by paragraph seven of Letter of Instruction No. 673 and previous applications and recommendations not in the prescribed form will not be considered.

Paragraph seven requires letter in own handwriting requesting consideration for commission with an outline of life prior to enlistment, birth certificate, form "Y" medical certificate, three letters of recommendation from responsible citizens in life prior to enlistment, transcript of high school record, and recommendations of immediate commanding officer.

Commissions given under this plan will be temporary appointments in either the Marine Corps or the Marine Corps Reserve, as applicable.

MCR's Over 38 May Go Inactive

Marine Corps Reserve officers, commissioned since December 7, 1941, who have reached their thirty-eighth birthday may secure an assignment to inactive status.

Officers in this category, many of them veterans of World War I, came into the service early in World War II to participate in the critical task of building and perfecting the machinery of administration of the Corps and of taking over duties of posts and stations. Many of them left well-established businesses and professions in order to do their patriotic duty with the Marine Corps. Some few, in spite of their age, have seen combat.

In many cases the tasks for which these officers entered the service have been accomplished. At their age, promotion appears doubtful, and they face the prospect of assignment to duties which are not necessarily commensurate with their rank. When these circumstances confront an officer in this category, there should be no hesitancy on his part in asking for relief from active duty.

T. O. Changes Deemed Undesirable

Commanding officers are cautioned by the Commandant against changing Tables of Organization, although recommendations for changes are invited.

It was explained that Tables of Organization are issued to permit all service agencies and echelons of command to plan for operations, procurement of armament, equipment, and personnel, and to insure equitable and orderly distribution of the means available to the Marine Corps for the accomplishment of its missions.

To aid in the administration of units, insure uniformity of normal tactical arrangement, and to indicate the basis for assigning personnel within any unit, the T.O. for that unit shows the normal tactical and administrative subdivisions of the unit, together with the personnel deemed necessary for the accomplishment of missions normal to the unit.

Temporary readjustments are not forbidden. To accomplish a specific mission it is within the prerogative of the commander concerned to employ the organization and means provided him as he sees fit, to strengthen or reduce as necessary the elements within his force.

Twice Wounded Veterans

Marine personnel serving outside continental limits of the United States will be returned to the States for rehabilitation after having been hospitalized twice from wounds received in action.

Only restrictions on an individual being returned in this manner are that both wounds must be received since the individual last left the United States; that each wound must be severe enough to require hospitalization of at least twenty-four hours; and that, after the second hospitalization, the individual must be returned by the cognizant medical authorities to duty while outside the continental limits of the United States.

Pocket-Sized Folder for 1st Sgts.

A new pocket-size, loose-leaf folder has been adopted for keeping personnel records of units operating in the field.

Available for issue at the Depot of Supplies, Philadelphia, to organizations in the Fleet Marine Force, the folder is called "Form NAVMC 29DP." It was designed by Warrant Officer John G. Stuttz.

Books

Recent Offerings for Military Readers. Books reviewed may be obtained at publishers' prices from The Marine Corps Gazette.

An Ex-German Officer Talks

The wonder is not that war came but that the democracies were so blind to its coming. That much is clear in the discerning, backstage sketches of nine German warlords, creators of the monster of total war, represented in the volume entitled *Hitler's Generals.*

W. E. Hart is a pseudonym for the author, who served under the men he writes about—von Fritsch, von Rundstedt, von Brauchitsch, von Bock, Rommel, Milch, Keitel, Doenitz. and Raeder. He was a German officer under the Weimar Republic, but he couldn't stomach Hitler. When war began, he volunteered for service in the British Army, was wounded and now is military correspondent for several English newspapers. His first book, published in English, was "Landmarks of Modern Strategy."

Behind the propaganda-painted picture of Hitler as a fanatical genius who masterminded Germany's rearmament and her startling success in the initial phases of the war, Hart shows the political strings, the clashes of personal ambitions and the real power held by the Reichswehr. The Junkers let the Nazis achieve dominance to further their own schemes of world power by force of arms, and their disregard of human values equalled Hitler's.

Hart calls von Rundstedt the ablest German military leader today and the nearest rival to the deposed and assassinated von Fritsch as a strategist. Von Fritsch, who completed war plans laid down by von Seeckt, was ready with a plan for invasion of Poland in 1928. With few changes, his plan was used in 1939. He had much to do with what he called "reconnaissance in the field of foreign policy," when he and Hitler created incidents to test the will of the democracies to halt expansion of the Reich.

Rommel is branded as an upstart and a faker who rode Hitler's coat-tails to high rank and command of the African campaign. Keitel the author calls a scheming careerist on whom many of Germany's blunders may be blamed.

Growth of the Luftwaffe is credited to Milch's talent for organization. Hart examines the strategical failure of Germany's air arm in the Battle of Britain and shows how its mass was unequal to the superior British planes and pilots. The blood bath through which the German Army went in Russia is credited largely to von Bock, pictured as a leader of limited strategical conceptions.

Some of the author's conclusions may be questioned, and they must remain in some doubt as long as his identity is a secret and his sources are on the other side of the European Fortress. However, he makes his subjects flesh and blood and his writing, sometimes awkward, has an authentic ring of military knowledge.—W. S. M.

HITLER'S GENERALS. By W. E. Hart. New York: Doubleday, Doran & Co. 222 pp. $2.75.

Aerial Bombs in Two Wars

Generally speaking, *Bombardment Aviation* is instructive, not only to aviation personnel who stand to learn about phases of aviation with which they are not too familiar, but also to military personnel of other branches of the service.

Keith Ayling's association with aviation since 1912 as a student, pilot, and aeronautical writer makes it possible for him to show the development of bombardment aviation from one war into the next. His source of information is firsthand experience and access to official records.

Many people will undoubtedly be enlightened as to the primary purpose of heavy bombardment used by the Allies and the Luftwaffe.

Of particular interest to people in Marine Aviation is a chapter on dive-bombing as employed by the Germans and of dive-bombing by Naval and Marine pilots.

There are several points on Naval and Marine dive-bombing which will challenge Naval aviators, but on this subject Mr. Ayling is writing from second-hand knowledge and the whole book should not be judged by this.

The complete details of the Polesti, Rumania raids are instructive and interesting.

This book presents an opportunity for Marine pilots to better understand the mission, purpose and function of the A.A.F.—N.H.

BOMBARDMENT AVIATION. By Keith Ayling. Harrisburg, Pennsylvania: The Telegraph Press. 234 pp. $2.00.

The Lusty Crew of the Mulligan Stew

If you're interested in life aboard a Liberty Ship, plus some breezy travelog notes along the Cape Horn route, you'll enjoy the book, *Purser's Progress.* It is written in a light, bright vein by Tom O'Reilly, a New York sports writer, who became purser on the *Mulligan Stew.*

The account deals mainly with the men of the Merchant Marine, although the sailor gun crew and four Army officer passengers come in for some

of the space. The *Mulligan Stew* has few real scares during the voyage the book tells about, but you are apt to find yourself admiring the merchant mariners. Many of them have been through torpedo experiences on other voyages. They are tough, lusty and quaint. They will jump into the ocean in full dress to save a kitten's life and they will raise hell with an American consul because they have received no mail.

Perhaps the most revealing part of the book is that, according to O'Reilly, there is no real conflict between the union seamen and the sailors, as some newspaper accounts would have you believe. There are "only the minor difficulties any fraternity has," O'Reilly says.

"An American seaman will fight but will wear no man's collar," O'Reilly says. As an illustration, he reports that at the beginning of a perilous trip one seaman asked another where he stood in the draft.

"3-A," he answered.

"Then you've nothing to worry about," was the comment.—H. H.

PURSER'S PROGRESS. By Tom O'Reilly. New York: Doubleday Doran and Company, Inc. 209 pp. $2.00.

Ferry Pilot

The subtitle of *Bombers Across,* "The Story of the Transatlantic Ferry Command," is somewhat misleading for the book is primarily Captain Edgar J. Wynn's account of his personal experiences as a ferry pilot. The account begins in Worcester Massachusetts, when at the age of five the author was dubbed a "speed demon" on his tricycle; takes him through his barnstorming, stunt-flying days, and on to flying as an instructor with the RCAF, to flights across the North Atlantic with the Royal Air Force Ferry Command, across the South Atlantic for Pan American Air Ferries, across both for TWA, and concludes with the author's enlistment in the U. S. Air Force as a captain in 1943.

Through Capt. Wynn's eyes readers of this volume will gain an intimate understanding of the men who in a few short years have made the world their osyter. As ferry pilots they have travelled about the globe more often and more readily than their earth-bound fellows travel their own country.

Owing to his association with various ferrying services from 1940 on, the author has been able to provide an understanding of the problems involved, and of the tremendous advances which have been made, in getting men and material, in a hurry, to the right places anywhere on earth. Although the events related are for the most part personal, the larger picture emerges.

The author makes a number of interesting observations. Some readers may quarrel with his contention that "the best training in the world won't make an expert (flyer) of a man who wasn't born that way," but Capt. Wynn's background lends some credence to his words.

On the subject of training he says further: "The Navy flyer is certain he is the best trained pilot in the world, as is the Army flyer. Both have a certain amount of contempt for the civilian pilot. The airline pilot looks down on them all. In my opinion, they are all wrong. I found that every pilot was an individual case; there are good and bad pilots in all categories. The best pilots we had on the North and South Atlantic were pilots who had spent years of barnstorming and had in addition some Army or Navy training."—H. B.

BOMBERS ACROSS, The Story of the Transatlantic Ferry Command. By Captain Edgar J. Wynn, USA. New York: E. P. Dutton & Co., Inc. 178 pp. $2.50.

The "No Boat's" Life and Battles

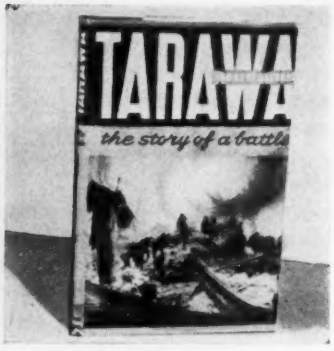
. . . and Pass the Ammunition is the saga of the heavy cruiser *U. S. S. New Orleans* by the "Padre" (Chaplain Howell M. Forgy) who gave the crew a battle cry which our nation took to heart after the shock of the attack on Pearl Harbor. It is the intimate story of the men who manned the *New Orleans*—affectionately called the "No-Boat"—as seen through the eyes of the "Padre" whose simple Christian faith sustained them through the tragic hours of many battles. The *New Orleans* was at Pearl Harbor when the Japs launched their sneak attack. She was in the fight in the Coral Sea, where our Navy collected the first installment of vengeance from our treacherous enemy. She was at Midway where Nippon's bid for control of the Mid-Pacific was thwarted. She was at Lunga Point. It was here that a Jap torpedo carried away her whole bow, taking many of her brave crew to their deaths.

The story of how the "No-Boat" was kept afloat through the heroism of her crew; how she was temporarily repaired in Tulagi Harbor; how she made the dangerous trip to Sydney, Australia, where a temporary bow was installed; how she was finally safely steered into a West Coast harbor and put in drydock for complete repairs; all this is lived by the reader, so vividly is the story told.

Chaplain Forgy tells his story simply and unobtrusively, but the reader can easily see the part he played in this heroic epic. His broad tolerance and sympathetic understanding of men enabled him to give the spiritual guidance and comfort which fortified them to face danger and death with courage and resolution.—J. B. R. Jr.

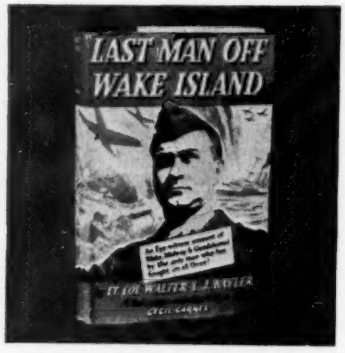
. . . AND PASS THE AMMUNITION. By Chaplain Howell M. Forgy, USN. New York: D. Appleton-Century Company. 242 pp. $2.00.

Books of Current Interest



TARAWA

Robert Sherrod's stirring and accurate account of the Marines on bloody Betio. As *Time Magazine's* correspondent he went ashore in an early wave to record one of the most dramatic battles in the history of the Corps. $2.00.



LAST MAN OFF WAKE ISLAND

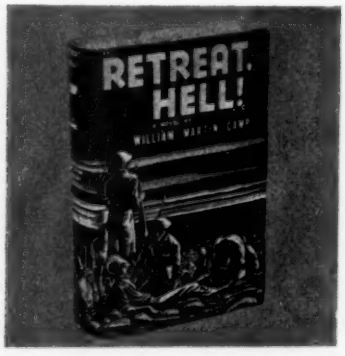
Here is the real story of the historic stand of the Marines on Wake Island as related by Lt. Colonel Walter L. J. Bayler, who was the only man to escape death or capture in the battle. $2.75.

BOOT

With grim humor Corporal Gilbert Bailey gives an honest, personal account of the gruelling process of becoming a Marine. Every Marine will treasure the book for its memories; for his family it is a typical record. $2.50.

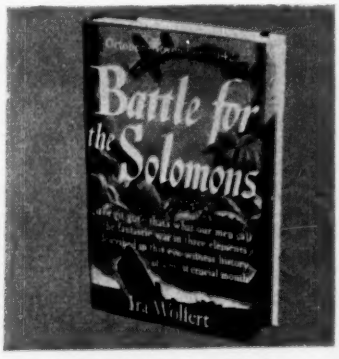
AND A FEW MARINES

Highly entertaining tales of Marines—doubtless the best collection ever penned—are unfolded by the late Colonel John W. Thomason, who was for 26 years in the U. S. Marines. $3.00.



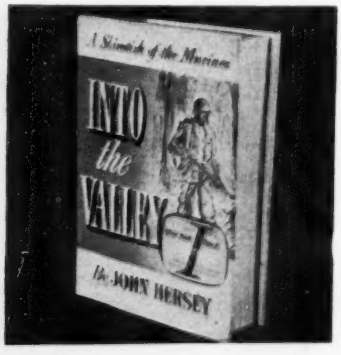
RETREAT, HELL!

A novel of the Fourth Marines in China and at Bataan and Corregidor, giving a rugged and accurate picture of the history-making Philippine campaign. By William Martin Camp. $3.00.



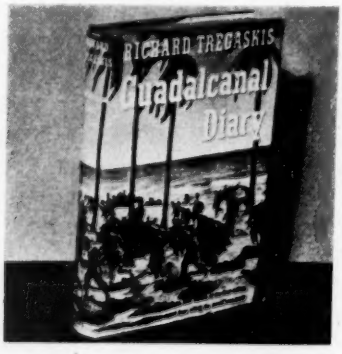
BATTLE FOR THE SOLOMONS

War correspondent Ira Wolfert, another eye-witness to the fighting by Marines in the early stages of the Solomons, wrote this book of the struggle. $2.00.



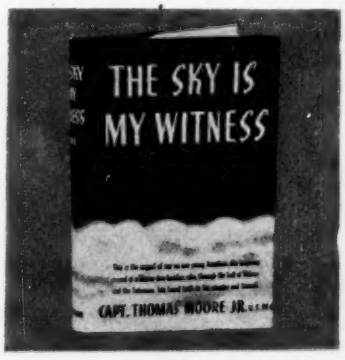
INTO THE VALLEY

Author John Hersey has proved most adept at capturing the thoughts and moods of the U. S. Marines in the bitter and gory Guadalcanal campaign. $2.00.



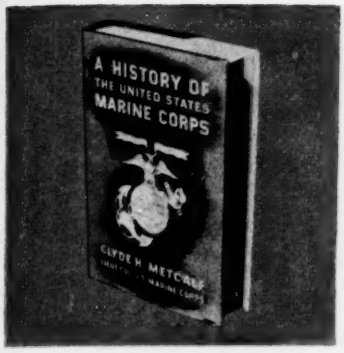
GUADALCANAL DIARY

Millions have heard of this book and thousands have read it. Richard Tregaskis, who was with the Leathernecks in the Solomons, is the author of this 263-page volume. Special edition $1.00.



THE SKY IS MY WITNESS

This is the impact of war on one American, the inspiring record of a Marine divebomber who went through the hell of Midway and the Solomons. $2.00.



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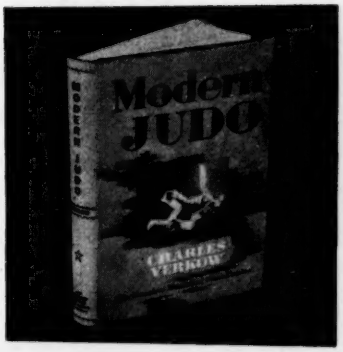

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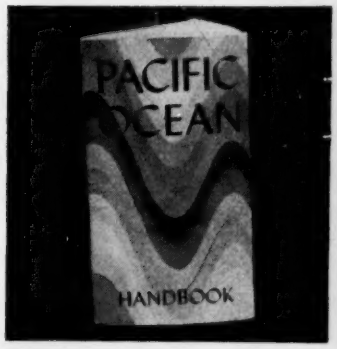
Four hundred pictures in 300 pages illustrating modern methods of refined mayhem are in this book by Charles Yerkow. Aggressive tactics for defense and offense make this an exceptionally valuable book for Marines everywhere. Illustrated. $3.00.



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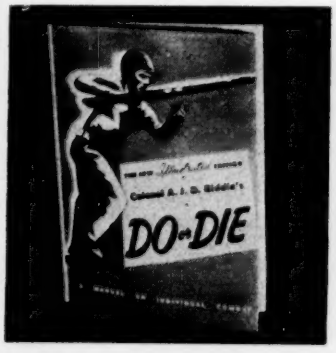
A handbook of information about the Pacific, particularly its weather, tides and currents, with tables and illustrations valuable for sea or air navigation. By Eliot G. Mears. Pocket size. $1.00.



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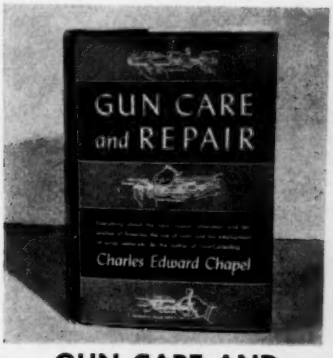

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Everything about the care, repair, and alteration of firearms; the use of tools and the employment of scrap materials. By ex-Marine Charles Chapel. $3.75.

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MARINE CORPS GAZETTE

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Official Coast Guard Photo

Bantam Tank

Gadget-minded occupation forces intently examine a pint-sized, one-man tank of Japanese design. The tank was stalled by American fire and abandoned by the Japs on Namur Island in the Marshalls Group.

Letters

New River Commands

Sirs:

I must take exception to two statements in the article on New River appearing in the April issue of the GAZETTE. First is the paragraph on page 55 beginning "The first phase of construction," which states that General Turnage established the Marine Barracks and Training Center on the 15th of September, 1941. I am quite sure that General Turnage, if he has seen the statement, has already written to say that it is not correct.

W. P. T. Hill arrived at New River to represent the Marine Corps in April, 1941. Effective on 1 May 1941, pursuant to a directive from the Commandant, a Marine Barracks was officially established at New River, under the command of Colonel Hill. Headquarters was in a cottage on the bluff at "Sleepy Hollow", near the present site of Camp Knox, the old CCC Camp. A fire guard detail from the 1st Marines arrived shortly after, and established a camp on Paradise Point. During the summer of 1941, Colonel Moriority brought the rest of the Marines to that location, where they took over an old hotel building and a number of cottages. Joint Army and Marine Corps maneuvers were held in the area during the summer of 1941 by forces under the command of Major General Holland M. Smith. Later in the summer the Headquarters of the Marine Barracks was moved to Montford Point, although the majority of the personnel, who were the original maintenance detail, occupied a farm house in the area now taken up by Tent Camp No. 2. The Montford Point establishment consisted of a group of farm houses, a pavilion, and some tents.

Colonel D. L. S. Brewster, and a small staff reported for duty at New River on September 12, 1941. Colonel Brewster assumed command of Marine Barracks, which had administrative control over the entire area under cognizance of the Marine Corps. Beginning 15 September, 1941, the organization and expansion of the Marine Barracks was carried out. The national colors were hoisted about September 20th. The first elements of the 1st Division began to arrive at New River in mid-September, and by the end of the month this Division was established in the Tent Camp, with the exception of the 11th Marines, who came in later and occupied a camp in the wilderness, about four miles from Verona. The 1st Division was commanded by Major General P. H. Tory during the fall and winter of 1941. Major General A. A. Vandegrift assumed command of the 1st Division in the early spring of 1942.

Upon the departure of the 1st Division for service in the South West Pacific, a Fleet Marine Force training center was tentatively established in the Tent Camp, under the command of Colonel Samuel A. Woods. Brigadier General Allen H. Turnage relieved Colonel Woods as Commanding General, FMF training center, in the summer of 1942. During this period, construction of the permanent area had progressed rapidly, and the Marine Bararcks were moved to the permanent buildings in August, 1942. During the fall of 1942 the training center from Quantico, Virginia, began to move to New River, and during that fall the Fleet Marine Force training center ceased to exist and the training center was officially opened. General (now Major General) Turnage having departed for the war zone, Major General Julien C. Smith became Commanding General of the training center, New River, N. C.

As 1943 opened, General Smith, by order of the Commandant, assumed command of all activities at New River, and the name "Camp Lejeune" was adopted. The command comprised the training center, the Marine Barracks, and FMF organizations on the station. In the spring of 1943, Colonel D. L. S. Brewster was elevated Brigadier General, and departed for the South Pacific, whereupon Colonel James Webb assumed command of the Marine Barracks. Sometime later Marine Barracks was abolished; the personnel was organized into the Camp Headquarters Battalion, Camp Service Battalion, and Camp Guard Battalion.

On page 56 the article on New River states that "in all probability" Henry Morgan and his band were the first white men to visit the section. There is no evidence that Henry Morgan and his pirates ever saw New River, and considerable evidence that they did not, as Henry Morgan is not known ever to have operated in the Atlantic coast of the continent, his activities having been confined to war with Spain, principally in the Caribbean, at about the time the first wretched settlements were attempted on the Hatteras Islands. The pirate Teach, popularly known as Blackbeard, who flourished about 100 years after Morgan, did have a headquarters on the Neuse River and was frequently seen in New Bern. It is barely possible that he may sometime or another have entered New River inlet.

F. W. HOPKINS,
Lieutenant Colonel, USMC,
Camp Engineer.

Camp Lejeune, N. C.

Editor—Colonel Hopkin's clarification of New River pirate lore is appreciated, as is his detailed review of the history of commands at the post.

The author of the article writes, "I hope I have done no one an injustice in implying that General Turnage took command in September, 1941, instead of the summer of 1942. In the interest of consciseness, it was my intent to mention only the generals who at various times commanded the post."

Now or Never?

Sirs:

Over the years many discussions of defects, improvements, and changes in uniforms are carried on in company offices, in the field, and at the club. I wonder how many of these discussions are ever written down for the consideration of the proper authority? Some of them come to mind now. And it is now, during the war, that uniforms should be changed if they are ever to be changed. In the post-war period, war stocks are bound to accumulate, and in a Corps of smaller strength it will take years to use up the accumulations economically.

Changes in uniform might be made before the end of the war, and no confusion would result. I sometimes marvel at the patience of the Washington tailor who is still holding my mess jacket, waiting for instructions as to whether he should add the gold sleeve markings of a Captain, Major, or Lieutenant Colonel, or whether he should throw it away. I do not know the answer; nor do I know the answers to these questions:

Are we to standardize the cap frame with a brown visor and interchangeable covers for blue, green, white, and khaki?

Are officers to continue wearing black shoes with blue uniforms in the same formation with enlisted men wearing brown shoes?

Is the sword to be returned to service for parades and ceremonies, or shall we wear a pistol and belt with our blues? Or should we have turned in our swords toward the scrap drive, instead of keeping them as souvenirs?

Will the present khaki trousers and shirt continue to be worn, or will we adopt the neater, more durable designs of the Army?

Will we re-adopt the tan shoe of yesterday, or shall we continue with today's unsightly low cut model? Will parades still see the "white socks" Marine passing in review?

Will we ever go back to the old type field scarf that did not curl up into a string; and will we continue to haunt clothing stores in a vain search for one to match our shirts?

Will we ever adopt a size system in clothing for issue, or will we continue to force our men into a "2M" or "6L"? If our present system is to continue, why do we not make it uniform and have small, medium, large shoes? Or socks? Or caps?

These and other questions might well be answered now. In particular, we should find an answer now to the question: "BUT SIR, WHY DON'T WE HAVE HIP POCKETS?"

C. A. RANDALL,
Lieutenant Colonel, USMC.

San Francisco, Cal.

Making Experience Count

Seizing Guadalcanal was just like putting our foot in a steel door that was being slammed shut. From that point, we were able to pry open the door—the door of the Solomons—through which we could pass to the inner sanctums of Japanese defense. We were able to sweep up through New Georgia to Bougainville. At the same time we succeeded in diverting some measure of the enemy's strength from his desperate efforts to amalgamate his gains.

I saw definite improvements, in several respects, in our Empress Augusta Bay landings at Bougainville over our first action at Guadalcanal. I should have been disappointed if those improvements had *not* been apparent, for in war above all else, we must make every ounce of *experience* count to utmost in our favor. When we had landed at Guadalcanal, we were full of theory but short on actual experience. We learned fast. At Bougainville, fifteen months later, the benefits of our experience were obvious.—Lieutenant General Alexander A. Vandegrift.

Military Digest

A Review of Current Military Thought

Wings, Today and Tomorrow

The British report 90,000 planes produced from war start to January 1, 1944, about 4000 over U. S. 1943 production of 85,946. Thus their 52 month average is 1730 compared with U. S. average of 3073, and their present rate should be three times average, or 5000 per month. Churchill recently said Russian output about equaled Britain's, indicating Allied production of just under 20,000 planes per month—estimated six times total Axis production.

Republic Aviation has delivered more than 6500 P-47 *Thunderbolt* fighters in the 48 months since the first one was test-flown. . . . Production of Allison liquid-cooled engines, which power about half of all Army fighters, has just passed the 50,000 mark; number 1 had 1000 hp., number 50,000 has 1800. . . . Wright produced *Cyclone* and *Whirlwind* engines aggregating 284,200,000 hp. from Pearl Harbor to January 1.

Two big airplanes are showing on the postwar horizon. One is Consolidated Vultee's Model 39, to be test-flown this spring, to have a range of 4000 miles, to seat 48 passengers or sleep 24, with baggage and 1200 pounds of mail. This is a new fuselage with *Liberator* (B-24) wings, engines, tail assembly and landing gear. The other is the Douglas DC-7, to seat 86 passengers or sleep 76. It will have a wing span of 173 feet, cruising range of 4000 miles, gross weight of 85,890 pounds, useful load 59,000 pounds, speed up to 400 m.p.h., and ceiling about 40,000 ft. with supercharged passenger cabin for sea-level breathing. It will cost about $1,250,000, carry four 3000-hp. engines, have tricycle landing gear with two wheels on each leg. This plane will be an expanded version of the DC-4, on which airlines were about to take delivery when the war started.

In "Wings After War", S. Paul Johnston, former editor of *Aviation*, says: Conventional airplane models will persist for several years after the war; perfection of the helicopter will take years of engineering effort; present light planes for personal use are so limited in utility that the annual rate of sale will not approach 20,000 for five years or so; "roadable" designs, to improve utility, will present difficult weight and cost problems; the all-wing (flying wing) design will not be practical in small sizes—in fact, its practical weight begins at 350,000 pounds; the future of cargo glider trains is not promising; a fleet of less than 1000 prewar transport planes can handle domestic traffic for five years; the Atlantic fleet will require fifty 50-passenger planes at the end of five, and forty 100-passenger at ten. He assumes popular air miracles, including jet propulsion, will be achieved, but not as soon as people think.—From *American Machinist.*

Five Acres for $5.00 a Year

How would you like to lease five acres of desert land right next to swanky Palm Springs, California, or picturesque Yucca Valley, for only five dollars a year?

Hollywood movie stars and big business executives have long paid twenty-five dollars a day and up merely to romp around Palm Springs, and most people don't know that, under the terms of the Five-Acre Tract Law, passed by Congress in 1938, any citizen meeting a few simple qualifications may, for five dollars a year, lease five acres of land from the Federal Government.

Servicemen discharged from the armed forces who know how restful and healthy life on a desert can be are beating a daily path to the United States District Land Offices requesting some land.

Take Larry Daley, for example. As a Marine, Larry saw plenty of action on Guadalcanal and, as a result was given a disability discharge.

When he returned to the United States, he wanted more than anything a place where he could get some rest and pull himself together.

One day last October, he walked into the Federal Land Office in Los Angeles, and asked the man in charge there, Mr. Paul Witmer, if it was true that he might have five acres for himself. He was shown maps of a few tracts of land which had been classified by the Secretary of the Interior as coming within the provisions of the law, and on October 12th he plunked down five dollars and applied for the lease of five acres near Victorville, California.

The Act says that the applicant must state the purposes for which the land is to be used, and Larry said he wanted it as a site suitable for the residence of a person who wished to recuperate from fatigue. Such land as Larry desired may be used as a home, camp, cabin, health, convalescent, recreational or business site; and, according to the regulations, "since the land is not intended

to produce a living, unless allocated for business, the applicant must furnish satisfactory evidence insuring financial responsibility adequate to maintain himself and family, if any, and successfully to carry out the undertaking for which he proposes to use the land."

Larry proved that his financial status was satisfactory, and on December 12th, just two months after he had filed the application for a lease, the go-ahead authorization came from Washington, where the Department of the Interior checks each application to see that all is regular and that the land to be leased has been surveyed and classified. Since then, Larry has built a house on the corner of his plot.

Department of the Interior spokesmen point out that the General Land Office welcomes any opportunity to be of service to ex-soldiers and add that other portions of the public domain, outside the California desert country, are available for leasing under the Five-Acre Tract Law. However, they also emphasize the dangers of seeking to obtain such a piece of land sight unseen, and recommend through personal investigation of water supply, transportation, and other factors of importance before application for any tract.—Lloyd Shearer in *The Saturday Evening Post,* May 20, 1944. Reprinted by special permission of the *Saturday Evening Post.* Copyright 1944, by the Curtis Publishing Company.

Our Tactics in the Pacific

Since our fleet strength, including its air component, is so much stronger than that of the Japs, it may be wondered: Why don't we drive by sea straight to the coast of China? Admiral King has made it rather plain that we intend to open the sea road there. China, after nearly seven years of war, needs our assistance badly, especially in the matter of equipment, supplies, and air power. Time and again our naval air component has taken the measure of Jap land and sea air forces and bested them. Furthermore, why don't we bomb Tokyo again with carrier-based planes? *

Undoubtedly, if we chose, we could do it, and if there were a prospect of bringing the Jap fleet out to fight a conclusive action we might try it. But the chances are that even under these conditions, the Jap fleet wouldn't emerge for an all-out action, but might counter with raiding tactics. So what would we gain? Under present conditions it would be a token operation, not the establishment of a continuous sea route for reinforcements, and while its political effect might carry some weight, its military value would not be high.

In the Pacific we have long passed the time for token operations or for raids, and have settled down to a continuous if slower move westward, under the rather sound principle that the less haste, the more speed. Even so, with the forces at our disposal, we have advanced westward faster than was thought possible a year or so ago.

Speaking generally, we have three Pacific aims. One is to establish a continuous sea road to China, by the shortest, quickest route. Another is to help MacArthur get to the Philippines. And a third is to go where we can bomb the Jap mainland mercilessly and continuously just as is being done in Europe to the Nazis today. These objectives are entirely independent of what Mountbatten may choose to do in and around Burma, Malaya, and the Netherland Indies, though naturally under the Allied plan for cooperation, each independent force will help the other when necessary. This principle was evoked when we aided in the attack on Sabang off Sumatra.

In the Pacific, we are not in a position to move west at too swift a gait until the war in Europe reaches its final stages. We need men, supplies, and equipment, and we need more aircraft and landing craft. While the European war is on, the Pacific gets only what can be spared from the European arena. It is considerable, especially in the matter of sea forces but it is still not enough for all-out war in the Orient.

Take the Philippines, for example. If the time it is taking to clean the Japs out of the Solomons and Bismark Archipelago is anything to go by, it will be a man-sized job, even if we by-pass many localities, before we can clean up the Philippines and establish a port there safe to be used as an adjunct to the convoy route. That takes time, for where large land masses are involved a considerable area must be cleared of the enemy before any port there is thoroughly safe to use. And this is not all.

Danger spots in the rear, left open by by-passing operations, must ultimately be eliminated. This takes time, and men, and time is the essence of things if we are going to reach China quickly. Ultimately we will occupy Manila or some other port we can use, but in all likelihood we will have to get to China first before any ports in the Philippines or the sea routes through them become thoroughly safe to use. We might not have thought so once, but the tremendous growth of our sea power seems to point toward shorter cuts.

And make no mistake, the carrying out of our three objectives involves no controversies in the matter of command. The meeting of MacArthur and Nimitz was a memorable occasion. Each undoubtedly agreed to help the other where assistance was needed. The occupation of Hollandia and Aitape were excellent examples of complete cooperation. The matter of whether the Army or

* This article was written before land-based B-29's began to raid Japan.—Ed.

Navy should have command in any particular strategy or tactical operation was settled long ago, in a decision of the Joint Board, to the effect that whichever service branch has paramount interest, that service should command.

We had better get over the idea that our military system needs a complete reorganization or that in the higher planes of command acute controversies can arise. Paramount interest settles that. Hence in Europe, we see Eisenhower in supreme command; in New Guinea, MacArthur; and in the Pacific, Nimitz.—By Admiral William V. Pratt, USN Retired, from *Newsweek*, May 15, 1944.

The Belgian "Invasion" Coast

What is the Belgian "invasion" coast like? Has it been invaded before and how successful were these invasions? Or simply, can this invasion coast be invaded?

If at Allied Headquarters in London there are Baedekers, the Command will find that "the best time for visiting Belgium is from mid-May to mid-September." This statement seems to apply to invaders as well as to tourists and should offer a clue to all armchair and other strategists.

In a country like Belgium, where weather conditions are extremely changeable and where rain and dampness prevail for a good part of the year, the opportune time for military operations coincides with the vacation season. Even then, nothing is certain about the weather, and Belgians are wont to say that on an average summer day they are likely to have fair samples of the traditional manifestations of the four seasons of the year. But anyway, from July to mid-August, one may with reasonable chance expect some nice days interspersed with heavy showers.

The North Sea borders the forty-two miles of Belgian coast from France to Holland. It is heavy gray sea, most of the time dramatic in its aspect, sullen, and changeable at a minute's notice. Thick clouds hang over it, low and leaden; strong breezes tear them apart. That unending process has for ages enchanted painters or driven them to despair, for the impressionists' view of a constantly changing atmosphere was nowhere better illustrated than there. There are sea-gulls, smaller and more numerous than the American ones, performing their antics over the heavy waves, and at night there could scarcely be a better scene for a raving King Lear.

In winter time when the vacationists have retired to the interior, the only people around are the husky fisher folk, who, like the New York postmen, are deterred neither by rain nor snow "from the swift accomplishment of their daily rounds." They belong to a sturdy race that has lived here for ages. From the ninth century on, they started reclaiming the salty marshes from the sea, and like the Dutch they succeeded in adding to their territory a strip of land about thirty miles in depth, which was to become the richest and most fertile soil of western Europe. They built dikes, and so great was their skill that long before the Hollanders made this art their own Flemish dikes were a byword. Dante, in his *Inferno*, mentions the great dikes the Flemish built from Cadzand to Bruges as if they were remarkable in that age as the great Boulder Dam in ours:

"Even as the Flemings 'twixt Cadzand and Bruges
Fearing the flood that t'wards them hurls itself
Their bulwarks build to put the sea to flight."

Behind these dikes the country lay flat and low. It has not changed. It was inhabited by a kind of people no king nor duke could subdue, the churls. They refused to submit to taxation or discipline, since they felt that the land they had reclaimed was rightly theirs. At one time in the thirteenth century, forty thousand of them were drowned when the dikes broke, but those who escaped prevented further disasters. Their descendants, the fishermen, at present live close to the sea, just behind the barrier of dunes, in small, lovely, thatch-roofed cottages, surrounded by little vegetable gardens where big sunflowers undulate in the wind. These people have little to do with the seasonal coast life on the board-walks and in the hotels.

Already in the middle of the sixteenth century an Italian author of great accuracy, Ludovico Guicciardini, stated that Belgium looked like one continuous town. For many decades the Belgian coast has looked like one continuous watering place. Apart from the few spots where the dunes have been systematically protected, there is no point on the Belgian coast where a village or a series of cottages are not visible. For forty-two miles there are about twenty seaside resorts which have developed since the eighties, when people got the idea that they should spend part of their time every year in the ozone-laden air of the coast. They built hotels—far too many of them. They set up boarding-houses. They had bands playing all along the board-walk, which in this damp climate is in fact a stone walk. In short, they did to the seashore what every civilized community does: they made it as ugly and as vulgar as possible, except for the great gray sea, to which they could do nothing. Moralists, of whom there is never a scarcity, had their task well cut out to contrast the majesty of nature's grandiose and immovable spectacle with the futility and folly of the doings of the humans on its fringe, just as though one week of fantasy was too much in a year of drabness.

The shore all along the Belgian coast slopes down gently. A five fathom line goes out ten miles.

The beach has fine and clean sand, there are no rocks, and the highest dunes—which are considered veritable mountains by the native—do not exceed ninety feet in height. Among the watering places exists a kind of dynastic rivalry. King Leopold II favored and developed Ostend, which consequently calls itself the queen of the coast. But another place calls itself the princess of the coast, and one—desperately in need, strange as it may seem, of a noble title—calls itself the duchess of the coastline. For many years Ostend indeed was the smartest, most fashionable seaside place in Europe, frequented by a mixed crowd of authentic grandees and a number of no less authentic panderers and professional gamblers. English and American ladies who were interested by the spectacle of human grandeur and depravity, wrote home that "A day in Ostend is a liberal education." To the north, the British had annexed a delightful place which they called "our Zoute" and the French have taken over De Panne to the south.—From *News from Belgium,* May 6, 1944.

This coast was invaded year after year for a long period, by the Norsemen in the eighth century. They came from Scandinavia on their fast narrow boats, raiding the country, establishing headquarters deep inland and spreading terror everywhere in their wake. So great was the impression they created that fifty years ago the peasant women in the Flemish villages were still praying in their litanies to be spared from "the cruelties of the Norsemen" who had left already a thousand years earlier. Little defense was offered these bold raiders. The next attack was not really an invasion. One night in April, 1918, daring British raiders blocked the German submarine base of Zeebrugge by sinking three cement-laden ships in its harbor. Since they turned back to England no other friend or foe has come from the sea to occupy this blessed land that has so many times been the battlefield of Europe.

Here in 1914 the Belgian army stood against the Germans. Here for the first time in history a battle was fought, the battle of the Yser, in which ground troops were sustained by naval artillery as well as by airplane action. Here too the Germans for the first time used the poison gas technique in 1915, in their murderous attack on the Canadians. In the salient of Ieperen (Ypres) 250,000 Germans fell, more than 100,000 Allied soldiers met ther fate. It is in these Flanders field that poppies blow between the crosses of 200 military cemeteries. Millions of men will remember to the end of their days the low-lying grasslands, the water-logged fields, the sticky mud of Flanders. Nor will they forget the Yser, its affluent the Yperlee, and the hundreds of little streams and ditches which cut this territory into small strips.

The Germans have fortified this area for four years now. During the first World War, they had 20,000 Russian prisoners build one of the heavy batteries along the coast. In this war they have used hundreds of thousands of men to consolidate the Westwall. They have transformed the hotels into fortresses. They have mined the waters and they have evacuated about 200,000 people inland. They expect the Allies to attack them on this terrain. They shout that they are prepared, although from time to time rumors say that these defenses are not solid and have many weaknesses. The proof of that pudding will, alas, also be in the eating.

Behind this coastal region, of depth of about 25 miles, lie the cities and towns which are the pride of Belgium and which are the loveliest among her 2,600 communes: Brugge (Bruges), perfect in its beauty and charm; Ieperen (Ypres) demolished and rebuilt; Dixmude, risen from its grave; Veurne, peaceful and coquettish in its delicate old buildings—all towns that in the course of their history have never known any other fortune but that of strife and war, that have been prosperous and haughty with wealth, that have been humiliated and destroyed several times.

The armies of all Europe have fought under their walls. 50,000 Canadians died in their vicinity. 50,000 Belgians fell here in the defense of their homes. No European can wander there without treading on holy ground. Will one of the decisive battles for freedom be fought here? On this soil where people conquered their liberty from tyrants nearly a thousand years ago? It is all in the lap of the gods, but those who know that Belgian "invasion" coast hope and pray that if one of the blows falls on this region the beauty that man made with so much genius and so much toil may be spared for generations to come.—From *News from Belgium,* May 6, 1944.

P-38 Lightning Now a Long-Range Fighter

A new long range P-38 Lightning, capable of more potent combat performance than any previous Lightnings, is now in action with the Army Air Forces.

Major characteristics of this improved twin-engine, twin-boom Lightning are: Range increase sufficient to make deep penetrations as fighter-escort on bomber missions; thirty per cent increase in horsepower; radical increase in rate of climb at altitudes over 30,000 feet and materially increased rate of climb at all altitudes; straight-away speed increased at high altitudes; service ceiling increased well in excess of 40,000 feet; single-engine speed increased to about 300 miles an hour; combat maneuverability greatly improved by mechanical aids to the pilot; unit power controls and automatic temperature controls to simplify the pilot's operational task.

Installation of an improved turbosupercharger and new intercooler installations, boosting the power of the twin Allison engines to over 1,500

horsepower each, has led to much of the improved performance of the new Lightnings. Externally, the latest model of the P-38 remains practically unchanged in appearance, and structurally it still is the sturdy ship that has seen intensive action on every front. The improved Lightning is a versatile ship, capable of service as fighter-bomber and as escort-fighter. In its role as fighter-bomber, the Lightning packs the heaviest bomb load of any AAF ship used in such a capacity. It is a deadly combat weapon in low-altitude bombing and strafing missions. Tankage additions to the P-38 make it a long-range fighter escort and a powerful member of the bomber teams now making deeply penetrating raids on the European continent.

The addition of new aileron boosters, combined with the old combat flap, turns the Lightning into a dogfighter which can outmaneuver many single-engine ships. Armament of the new P-38 remains the same as its predecessors, consisting of one 20-mm. cannon and four caliber .50 machine guns, concentrated in the nose. The P-38 is made by Lockheed Aircraft Corporation.—From *Army Ordnance,* May-June, 1944.

I Saw Russia's Air Power

The P-39 fighter was first sent to Russia as a result of a Lease-Lend transfer from England of a relatively small number of airplanes. These planes were assembled and flown at a base near Moscow in the winter of 1941-1942. It wasn't until 1943, however, that representatives of the Bell Aircraft Company or Allison Motor representatives were able to visit Russia to see what design improvements in the Airacobra and later Bell fighters seemed desirable in the light of Russian experience. We found that the Airacobra was performing very well as a short-range fighter at medium altitudes, although at times it is used for other purposes. Usually Russian attack airplanes are employed for strafing and low level bombing attacks, rather than as fighters.

As a Russian fighter, the P-39 is lightened by omitting the wing guns and by using somewhat less radio than is originally installed at the factory. Certain modifications were necessary at first for earlier P-39 models because of the rigors of winter on some parts of the front, but most of these are now incorporated into the airplane's design.

In most respects, however, the P-39, as operated in Russia, is identical with its sister ships in the South Pacific and other American war theaters. The original paint is altered only by replacing the American insignia with the red star, and the original decalcomanias which locate points for servicing operations and items of equipment are permitted to remain in English, even though at first sight they must be as confusing to the Russian mechanics as even the most familiar words were to us when written in the Russian alphabet.

The task of translating service literature from English to Russian is carried out continuously by Technicians of the Red Airforces.

The Airacobra's records in combats with German fighters, dive bombers, and medium bombers is very good, some Airacobra pilots having as many as 30 victories to their credit.

For the most part, fighting conditions vary from those encountered in North Africa, Italy and the South Pacific in that the country is quite level, which permits installing airfields close to the front lines so that operations rarely require the use of auxiliary fuel tanks. It is thus more frequently possible for the pilot to land back of his own front lines in spite of severe damage to airplane structure or power plant.

Combats usually take place at altitudes of 15,000 feet or less, rather than at the extreme altitudes sometimes required in other theaters. It is characteristic of the fighting in Russia that comparatively little long-range strategic bombing has been carried out by either side.

Russian airplane production is concentrated chiefly upon single engine fighters, such as the Yak-9 and LA-5; twin engine dive bombers and medium bombers such as the PE-2 and DB-3; the well known single engine Stormovik attack airplane; and military versions of the Douglas DC-3.

Although the bulk of Russian operated airplanes are Russian built, these have been supplemented by American planes which are of similar types, except that the Stormovik has no close American counterpart. They are operated in Russia without the help of American technicians, other than for several brief visits by technical advisors.

An excellent opportunity to see several modern Russian fighters and the PE-2 dive bomber at close range and to compare them with allied and enemy types was afforded the writer at a branch of the Central Aerodynamic & Hydronamic Institute, which is in many respects a counterpart of our NACA.

This exhibit is permanent and intended to acquaint Russian aeronautical designers with arrangements, mechanisms and methods of construction which are used by others. To make the interior details easier to see, much of the wing and fuselage covering material is removed on one side of the aircraft's plan of symmetry.

It was the writer's impression that the Russian airplanes were simplest, the German airplanes were best designed for servicing, and that American airplanes, characteristically, contained the most radio equipment, the best heaters and aviation instruments, and were better adapted to a wide range of operating conditions.

Russian airplanes, particularly the Stormovik and fighter types, employ wooden plastic bonded construction extensively or mixed wood, duraluminum and steel structures. The most notable example of mixed construction is the Yak-9 which has wooden wing covering and ribs, steel and duraluminum spars, a steel type fuselage and duraluminum tail surfaces.

Russian fighter types employ heavy machine guns and cannon mounted near the center line of the airplane, and they are comparatively lightly armed and armored. Their low weight-to-power ratios result in good rates of climb, while their top speed is approximately the same as that of opposing enemy fighters. Russian fighters are comparatively unencumbered by radio equipment, blind flying equipment, elaborate starting systems, heaters, life rafts, and the like. Landing speeds are about the same as those of American fighters.

The use of wooden construction apparently involves some, but not excessive, increases in structural weight. Its resistance to explosive projectiles is poorer, although the damage done by solid projectiles is comparable with that done to duraluminum structures. The extensive use of wood is apparently dictated by shortages of duraluminum, machinery, and skilled labor.

The writer mentions a visit to a large base on the Central front. He was impressed by the difficulties of performing maintenance operations under combat conditions, with little shelter available in which to work. Since most combat operations took place during the day it was common to service the airplanes at night. In discussion with pilots and technicians, it was found that certain difficulties were noted to be peculiar to operating conditions in Russia. Necessity of the use of very high octane fuel was particularly objectionable since such fuel is not required for Russian built airplanes and thus presents a special transportation difficulty.

To an American, the entire transportation problem in Russia seems staggering since few good roads exist between populated places. This puts a very heavy load on the railroads and results in expensive use of transport airplanes to move personnel and light types of equipment. In discussion with top-notch Russian technicians it was mentioned that flutter speeds were likely to be low for wooden wings. It was indicated that flight load factors for fighter aircraft that are used by Russian fighters are slightly higher than used for U. S. fighter types and that the height of drop for the landing gear is greater. However, no landing load factor is specified, but depends upon the shock-strut characteristics.

It is quite likely that we can learn much about front line air warfare from the Soviet Airforces which have made very successful use of certain specialized types of airplanes. The most outstanding of them is the Stormovik, a very heavily armed and armored single engine attack airplane. Escorted by fighters it operates at low levels and deals very effectively with artillery positions, machine gun nests and tanks. Although relatively slow and not highly maneuverable, its ability to resist the effect of small caliber fire permits it to operate at heights of eighty feet from the ground, where it is barely seen from large caliber antiaircraft installations. Its heavy armored plaint forms a forward fuselage structure and it is equipped with bombs in wing bomb bays, cannon of from 20mm to 37mm, machine guns and rocket guns.
—From *Aviation,* May, 1944.

Aerial Incendiaries

The Chemical Warfare Service of the Army Service Forces has the responsibility of supplying every category of incendiary used by the Navy and Marine Corps, as well as by the Army Air Forces and Army Ground Forces. They also send quantities of incendiaries to our allies.

At the beginning of the war, incendiary munitions accounted for only about five per cent of our bomb loads; of late, they have averaged sixty per cent and, in some instances, there have been all-incendiary loads.

Chemical Warfare Service production of incendiary bombs goes into hundreds of millions. Seven main types of these bombs already are devastating German and Japanese installations, and other new items are in development. In general, the bombs in current use comprise magnesium, thermate, phosphorus, and oil varieties. In size they range from 2-pound "firesticks" to 500-pound "blockburners." All have proved destructive, either alone or in conjunction with high-explosive bombs. The incendiaries are most effective against warehouses, factories, and other combustible buildings, but also spread havoc when their blazing chemicals scatter through the rubble caused by the high explosives.

Magnesium bombs weigh two or four pounds apiece and resemble giant metal firecrackers. A bomber can carry as many at 1,500 at a time. Usually released in clusters, they disperse to fall individually, like handfuls of sparks on a carpet. Although only one out of a dozen can be expected to land on something inflammable, their wide coverage can start hundreds of fires almost simultaneously.

The AN-M52 2-pound magnesium bomb consists of an hexagonal, cored magnesium-alloy body containing a thermate igniting composition, and igniting charge, and a hollow sheet-steel tail. It burns for about 8 minutes at a temperature of 2,300 degrees Fahrenheit.

The M50 4-pound magnesium bomb, also hexagonal in shape, has a blunt cast-iron nose and a cored magnesium-alloy body with thermate burning composition, igniting charge, fuse mechanism, and hollow sheet-steel tail. It will burn six to eight minutes at the same temperature as the AN-M52.

The AN-M54 4-pound thermate bomb consists of a hollow steel tube with an hexagonal tail. The tubular body holds almost 2 pounds of thermate, which burns for 3 to 4 minutes at 3,400 degrees Fahrenheit, the intense heat melting the steel tube and releasing molten metal to run across the target, setting fires in its path. Because of its intense heat, the bomb is used against targets difficult to ignite. It, too, is dropped in clusters.

The M69 6-pound jellied oil bomb, hexagonal in shape, explodes on impact with spectacular effect. Bursting, it shoots out flaming oil and rubber as far as twenty-five yards in all directions. This bomb is furnished in two types, one containing "gelgas"—a resin-type jelly—and the other a composition which is mixed with gasoline. These bombs also are clustered.

The M47 100-pound iellied oil bomb is a thin-walled shell weighing only 20 pounds when empty and consisting of a rolled-steel cylindrical body 8 inches in diameter and 45 inches long. Formerly it was filled with gasoline mixed with crude latex, caustic soda, and coconut oil. It now contains jellied oil, which scatters on impact in flaming chunks over an area forty yards in diameter. These particles of solidified oil cling to material for several minutes and are difficult to extinguish.

The M76, "goop," or PT bomb, is a 500-pound bomb containing a mixture of jellied oil, finely powdered scrap magnesium, and other ingredients. The ground magnesium shavings, when mixed with other incendiary material, provide a tremendously destructive fire agent. This bomb, which is the most recent type of incendiary to fall on German installations, cannot be extinguished.

The M1 30-pound white-phosphorus bomb, which holds twelve pounds of that agent, resembles a fat cigar with a small propeller and a large steel fin. The phosphorus scatters its sticky, flaming tentacles over an area fifty to one hundred yards in diameter. Besides acting as an incendiary, it is an antipersonnel agent and can also produce dense clouds of white smoke. The M1 is suspended vertically in the bomb bay of an airplane. When released by the bombardier, it falls free, the propeller (or arming vane) spinning for several revolutions and then falling away into space. This frees the bomb fuze for action. The propeller can be set to fall off after about a dozen or more revolutions, depending on how far the bomb is to be dropped before arming itself to explode on impact. This bomb, just short of one yard in length, has tremendous firepower, but, because of its relatively light weight, must be released from low altitudes in order to strike with accuracy.

When released from the bomb bay, clusters of incendiaries automatically break open, spreading their packaged fire through space. Each cluster contains up to 128 of the 4-pounders packed together and has a total weight up to 500 pounds. Each cluster includes a certain percentage of bombs loaded with an extra amount of TNT. These special bombs have delayed explosion to discourage efforts to extinguish them.

The M17 aimable cluster is the latest idea in incendiary-bomb packing. Ths cluster, which has a nose and a tail as though it were one bomb to permit the light M50 bombs to be aimed with precision, drops as a unit from the bombing plane. After reaching the proper altitude, a time fuze imbedded in the cluster explodes a primacord charge and opens up the clustered bombs, which then fall toward the target with greater dispersion.

The manufacture of incendiary bombs is primarily a civilian job, the flow of this item being regulated by seven Chemical Warfare Procurement Districts into which the country has been divided for procurement purposes.

Four days after Pearl Harbor, the first incendiary-bombs were rolling off the assembly line and the unceasing flow has swelled from month to month ever since. The incendiary-bomb program was given to the Chemical Warfare Service in August 1941.

In order to meet the stepped-up needs of the Army Air Forces, the development of new-type bombs and their quick manufacture has involved great ingenuity in production.

In addition to the development and manufacture of new type incendiaries, the Chemical Warfare Service also is responsible for testing these munitions as they come off the production lines. Skip-bomb ranges at Edgewood Arsenal, Md., and Pine Bluff Arsenal make it possible to test sample bombs within a few hours after they are turned out at these installations, which guarantees and speeds up supply.

CWS incendiaries have demonstrated their power of destruction. The Seaua Roma company tanks were completely wiped out in the August, 1943, raid on the Ploesti oil refineries in Rumania. Hamburg was hit with fifty-six tons of fire from the skies on July 26, 1943; Schweinfurt received 88 tons on October 14, 1943, when the incendiary action, together with 485 tons of high explosives, virtually eliminated that German roller-bearing center.

Against plants and other combustible material, the incendiaries are tremendously effective. One cluster of bombs can start a dozen serious fires over a wide area. The same weight of high explosives can create much greater destruction over a small area. But fires started by incendaries can

spread for blocks until whole areas are destroyed. With the recent development of "blockburners," such as the 500-pound "goop," the trail of fire from CWS incendiaries can be expected to leap with ever greater momentum through enemy installations.—*Army Ordnance,* May-June, 1944.

Reading An Aerial Photograph

How often you must have looked out from a carriage window at a factory town. What is the first thing you notice? The factory chimneys. Were you to fly in an airplane over this same town and look down at these chimneys they would look like pin-points. You would be taking an air view. This is what the interpreter has to do when he studies air photographs—instinctively—and all the time. For those people with no flying experience it is difficult. But it is by no means impossible.

Before any large-scale military action, thousands of these air photographs are taken in an effort to reveal enemy strongpoints, concentrations of troops or transport, gun positions, and—equally important—the lie of the land, or "ground pattern" as it is called. From the study and interpretation of these pictures are prepared scale models containing the minutest details, and these are examined closely by those responsible for the coming operation. More often than not, the necessary chain of intelligence is collected quite a long time before the proposed operation, and this gives the reconnaissance crews every chance of taking their photographs under all possible conditions and at all heights, from as low as fifty feet to 30,000 feet and more.

The interpreter, when he first takes up an air photograph, turns it so that the light by which he is examining it falls in the same direction as the rays of the sun at the time of exposure. To do this, he makes certain that the shadows fall away from the light. Do the opposite and you will get reversal of reliefs—hills will appear as depressions and *vice versa.*

Already he will be provided with certain data. First, he is given a sheet number and map reference, which will guide him in relating the photograph to the scale map. He then prepares another map on a considerably larger scale and containing every detail on the photograph. The height in feet at which the photograph was taken, in conjunction with the focal length of the camera, tells him the scale. Here, for interest, is his standard formula:

$$\frac{\text{Focal length in inches}}{\text{Height in feet X 12}} = \text{Natural Scale}$$

$$\frac{\text{Height in feet}}{\text{3 X focal length in inches}} = \text{yards to the inch on contact prints}$$

With a knowledge, then, of the scale of the photograph and its relation to the map of the district, he can now look for individual points of recognition.

The panchromatic film used in the modern air camera does not reproduce the colours of nature, but monochromes only. It does, however, deal fairly with colour (excepting only red and yellows, which possess a very strong colour punch), and it produces a reasonably accurate tonal representation, graduating in scale from black to white through the various shades of grey. The photographic processor, recognising that the basis of interpretation of any kind lies in the establishment of contrast, assists the interpreter by exaggerating these total differences so that objects almost invisible to the human eye will appear on the photograph.

What governs tone, then, if it is not colour? An object with a smooth surface will probably appear light on an air photograph, regardless of its colour. If the surface is textured, it will appear dark. But no hard-and-fact rules can be laid down, for tonal values differ widely as the photograph is taken up-sun or down-sun or in conditions of flat lighting. Water may appear white if the reflection of the sun ray's is inclined toward the camera, black if inclined away from the camera, and grey where there is a complete absence of reflection. Tonal values may depend, too, on the time of the exposure, and on the colour sensitivity of the photographic emulsion used.

A texture surface is simply one that contains shadow when viewed from above. Most living vegetation grows upwards and so contains shadows when looked at from above. Grass vertically, however deep, will reflect very little light to the vertical camera, and the shadows cast by the blades will show up clearly. Therefore, deep green grass will appear very dark on an air photo. If the grass were to be pressed down on its side, by tramping or rolling, it would then lose most of its shadow and present a much broader reflective surface. That is why a track made through deep grass will appear very light on an air photograph, although it may be hardly noticeable from the ground.

Long grass will photograph darker than short grass, for it has greater shadow in it. Crops with broad, flat leaves, reflecting the light upwards, may appear very light. Old plough is usually light, new plough dark. Large stretches of water are usually lighter than narrow streams and ditches. Concrete or macadam roads are very light, tarmac is darker. Railway tracks, easily recognised because they are always laid in straight lines and take gentle curves, photograph light when new and reflective, dark when old. Tracks showing light across grass in dry weather may look dark if the grass has been soaked with rain. Newly dug trenches may often be recognized by the lightness of the soil turned up

and left on the sides and wire fencing, although very difficult to spot when first put up, is often betrayed later by the long grass that grows up around and between it, and shows it up in dark relief against the shorter grass of the rest of the field. All these, and more, are common points of recognition. All are derived from a study of tonal values. But there are still other points to be established.

Shadow may tell the interpreter two things. He may, by the use of geometry, calculate the elevational size of the object casting the shadow, and he may also define the elevational shape. He must find out, however, before he arrives at his answer, the slope of the ground on which the object is situated for the angle of inclination will directly control the shadow. His most convenient way of doing this is by comparing the object with a neighbouring object; otherwise he must calculate in terms of ratios. Heavy shadow often completely conceals an object, and in such cases the interpreter is grateful for a selection of photographs taken under different conditions of light. The professional interpreter has a good memory, and in many cases the elevational shape and size of an object will be sufficient in themselves for him to identify it immediately. He has seen these standard marks of the ground many times before, and he is in no doubt as to their significance. But there are other times when he is baffled.

It may be that the shape is unfamiliar to him; perhaps it is effectively camouflaged; perhaps it is even a new device, a weapon employed now for the first time. In this case he falls back on what he calls "associative features."

He looks for tell-tale tracks, marks that didn't exist there before, and which converge on to a dark shape in the middle of a field and then go no farther. He looks for vehicles carelessly parked in the open, for cable lines that might signify a headquarters, for unexpected movements of bodies of men, of strange geometrical shapes that only man is responsible for, never nature.

The camera may be the all-seeing eye, but it requires a trained man to interpret all that this eye records.—By Michael Goodwin from *Britain,* May, 1944.

The Carbine Grenade Launcher

Now equipped with the grenade launcher, the lightweight carbine in the hands of a well-trained foot soldier can stop a 30-ton tank. Attachment of the grenade launcher is one of several new improvements which make the carbine more effective than ever.

Use of the grenade launcher gives the caliber .30, 5½-pound, 3-foot-long carbine the same anti-mechanized firepower as the heavier 1903 and M1 (Garand) rifles, which also use it. It can be employed against tanks and men and for pyrotechnic signals. Other improvements to the carbine add to its accuracy of fire and also lessen the effects of recoil and reduce the trigger pull.

Infantry divisions now are equipped with nearly as many carbines as heavier rifles. The carbine's rapid-fire action, light weight, and lesser recoil make it a valuable close-in weapon where there is need for greater power and accuracy than the pistol provides. A soldier can carry approximately twice as many cartridges for the carbine as for the other rifles, since they weigh only about half as much.—From *Army Ordnance,* May-June, 1944.

Peashooters Should Be Troubleshooters

A plane that cannot be "put on alert" is not worth a damn to anybody at a front-line fighter base. In the South Pacific area there never has been a surplus of airplanes, and each one in fighting shape seems more precious than life itself to the personnel operating in that theater.

In short, whatever it takes to keep equipment in flying condition assumes more importance than almost anything else. Accordingly, practically everybody is maintenance-minded—and if the fighter pilot isn't, he should be.

Few people think of the pilot as a factor in maintenance, and in many cases not enough pilots are fully aware of their importance to the maintenance function. The pilot has a perfect right to expect his plane to be kept in top-notch condition—but the crew chief can do his job best when the pilot, who is experiencing the trouble, helps with the diagnosis and (when feasible) with the cure.

The essentials of keeping equipment operating against the enemy are few but intricate within themselves. First, the equipment must be of rugged design and inherently trouble-free. Second, supply must be established as the life blood of operations. A highly trained maintenance organization is a mockery without adequate provision for spare parts supply. The third factor combines the flight crew and ground crew on the line. Neither crew can work alone and get the desired results; teamwork is the essential operating requirement.

A pilot's responsibility does not end with his saying to the crew chief "The damned thing doesn't run right." His salvation, in fact, may depend on telling his crew chief precisely and accurately which specific part is not functioning correctly, and the more he knows about why it is malfunctioning (and in many cases what to do about it) the better the entire operating team will function.

Excluding the supply factor, the smallest self-contained combat unit in a fighter command is a squadron. The team nucleus is a fighter pilot and his crew chief, who are directly responsible for employing the fighter plane to best advantage against the enemy. The crew chief and his assistant are expert technicians, capable of servicing all working parts of the aircraft, including both rigging and engine. In charge of the crew chiefs is the line chief, who is consulted when any special difficulties are encountered. An engineering officer directs all maintenance functions in the squadron, and he reports directly to the squadron commanding officer.

Each airplane has its idiosyncracies, and a pilot who learns to spot the difference between them and real trouble will save a great deal of servicing time. A ship may develop strange sounds, the engine may run roughly, or some of the instruments may be a little off. With a little experience the pilot can learn to recognize them as nothing serious and accordingly he will not order the plane off alert when it may be badly needed. He can save the crew chief a lot of needless work if he tells him about such plane characteristics so that a new pilot flying the plane shall be informed properly and not return from an incompleted mission with orders for a thorough check.

A great deal of mechanical trouble is just plain pilot trouble. The crew chief may put in many hours trying to track down difficulties reported by the pilot when, in fact, the pilot has been improperly setting his fuel mixture, or cooling flaps, or merely doesn't know when to use the fuel booster pump.

The fighter pilot should know his airplane. He should strive to be as good a trouble shooter as he is a pilot. One of the simplest and quickest ways to achieve this end is to be inquisitive. When trouble develops and is corrected by the crew chief, the pilot will profit if he ascertains from the crew chief exactly what the difficulty was—and it is a good idea for the pilot to learn what caused it and how it was corrected. If it should happen again the pilot would be able to recognize it, refer the precise trouble to the crew chief, and get the airplane back on alert with a minimum of effort. A valuable by-product of this procedure is the building up, between pilots and crew chiefs, of a personal interest in each other's work. An inevitable improvement in achievement results.—From *Aviation*, May, 1944.

Employment of Tank Destroyers

When France fell, General Marshall issued a directive to his staff: "Find a solution to the problem of defense against armored forces—using an *offensive* weapon and organization." As a result of this directive, tank destroyers, armed, equipped and trained for the specific mission of destroying hostile armor, were created. The development of American tank destroyer doctrine has had great influence on the British antitank doctrine, as well as on Russian and German Doctrine.

The first tank destroyer was an improvisation in the form of a half track with a 75-mm gun mounted facing to the front. The idea came partly from a French ordnance designer, who related the successful use of an old 75-mm gun mounted on a five-ton truck.

Prior to the development of the tank destroyer, the best known defense against tanks was the expensive and unsatisfactory method of using other tanks to combat them.

Another expedient tank destroyer was the 3″-AA gun, mounted on the M-4 tank chassis. This destroyer, known as the M-10, has proven itself in combat, in spite of its limitations.

Concurrent with the development of a self-propelled gun, utilization was made of the towed gun. During this early period, both the 37-mm and the 75-mm were capable of destroying the tank of their period at close ranges. Since this time, developments in armor have been countered by the development of the higher velocity, heavier caliber, antitank weapon, both towed and self-propelled.

The primary mission of tank destroyer units is the destruction of hostile tanks by fire of a superior mass of guns. This destruction is accomplished by *direct* fire.

Although artillery of 105-mm and larger caliber are effective against tanks when direct hits are scored by indirect methods, this method has not proven successful as a means of stopping hostile armor.

Tank destroyers are broadly divided into self-propelled and towed guns. These guns are high velocity, flat trajectory weapons, capable of penetrating all known armored vehicles at normal battle ranges.

There is available ammunition of various types, including HE, AP, explosive APC and Smoke, to accomplish the various missions. The gun is characterized by great accuracy as a direct fire weapon owing to the small dispersion of its shot group, excellent direct fire sights and an improved power traverse.

Steps have consistently been taken to develop and produce a mount with specific desired characteristics which would include superior cross-country mobility, sufficient flotation to permit employment in varied types of terrain, and speed equal to or greater than that of the opponent that it is designed to destroy. Neither the M-3 with the 75-mm nor the M-10 were satisfactory.

The prime mover for the towed gun is, at present the half-track, which in many cases cannot negotiate terrain satisfactorily, or must do so at very slow speeds.

The speed of the self-propelled destroyer represents reserve power and should be utilized only when conditions require rapid movement. Normally, destroyers in contact with hostile forces will move *very slowly,* in order to reduce dust and avoid attracting attention.

Tank destroyers are provided with light armor as a protection against small arms, machine guns and fragments. They should never attempt to fight as tanks. However, the M-10 destroyer has armor characteristics which make it comparable to the German Mark III and Mark IV tanks.

The requirements for the tank destroyer as a weapon, as specified by General A. D. Bruce are:

"What we are after is a fast moving vehicle armed with a weapon with a powerful punch which can be easily and quickly fired, and in the last analysis, we would like to get armored protection against small arms fire so that this weapon cannot be put out by a machine gun."

The primary tactical unit of tank destroyers is the battalion and should normally be employed *by battalion.* The employment of smaller units seldom gives good results and frequently fails.

The battalion includes a headquarters company, and three gun companies and attached medical personnel. There is a difference between the towed and the self-propelled battalions. The towed battalion includes in its headquarters company, and two reconnaissance platoons. The self-propelled battalion includes a separate organic, reconnaissance company of three platoons and a pioneer platoon.

There are considerably more guns in a tank destroyer battalion than there are in a field artillery battalion.

Group and brigade headquarters are provided in order to facilitate the tactical employment of massed tank destroyers. A group is suitable for assignment to a corps, and a brigade is appropriate for the tactical employment of a number of groups against a strong armored force.

The platoon is the basic fire unit of the destroyer organization, and includes a small security section.

The missions of tank destroyers are divided into two general categories: the *primary* mission —the destruction of hostile tanks by direct gun fire, and the *secondary* missions, which are numerous.

Secondary missions include the employment of the guns to reinforce or supplement those of the artillery, *when it can be foreseen that they will not be needed in their primary role.* They may be used to reduce prepared positions, concrete emplacements and machine gun nests by direct gun fire. At night, they are extremely effective in knocking out machine guns, located by observation of the source of the tracer elements. They may be employed on roving gun missions, and are effective in both defense and assault of beaches.

In general, self-propelled battalions are more suitable for attachment to armored divisions, and towed battalions for attachment to infantry divisions. *This is not a rule,* and frequently the reverse may be the case. When available in the theater, one or more battalions, in addition to those attached to divisions, are kept under corps or army control to provide a mass of tank destroyers to meet the hostile armored attack, as it develops. If some destroyers are to be emplaced initially to cover the deployment of the mobile destroyer reserves, it is preferable to emplace the towed gun and use the self-propelled gun for the maneuvering force. Destroyers held in mobile reserve, whether employed on a secondary mission or not, should push vigorous reconnaissance for routes to the position areas in the probable localities of employment on the primary mission. For this reason, battalions used as artillery are not attached, but fill the traditional role of reinforcing artillery. The employment of towed guns differs from the employment of self-propelled guns, primarily in that towed guns have less battlefield mobility and less armor protection. However, they are more easily concealed on the battlefield.

The decision to employ tank destroyers rests with the higher commander. The decision of *how to accomplish the mission assigned,* rests with the tank destroyer commander.

Hostile armor usually holds the initiative, at least locally, and, for the time being. Tank destroyers gain the advantage through *thorough reconnaissance,* pre-selection and preparation of positions, and routes of approach thereto. Complete and thorough plans must be made, and their revision is continuous.

The reconnaissance elements select the routes over which the battallion must pass to reach the various areas of employment, and indicate the general position areas for the gun companies. After the position is selected, reconnaissance to gain and maintain contact with the armored elements should be vigorous.

During the fire fight some reconnaissance elements will remain in contact between the hostile armor and the friendly guns, while other portions locate the flanks of the armored thrust.

In general, the towed gun is best fitted for employment with infantry divisions, or in situations where it may be dug in and emplaced initially. Its lack of mobility must be compensated for by protection afforded by digging in, and by painstaking concealment. It is preferable to emplace towed guns under cover of darkness or smoke. Their fires should be used to reinforce and deepen those of the organic antitank weapons.

Normally, the missions of a towed battalion will

be those of strengthening the existing antitank defenses, protecting flanks opened to hostile armored attack, protecting artillery position areas and rear installations, constituting a mobile reserve against a counterattack and employment on their secondary missions, where the enemy situation permits.

Self-propelled guns are well suited to employment with armored divisions and to furnishing mobile elements to infantry divisions for the destruction of located tank thrusts.

Routes to and position areas for self-propelled guns must receive the same careful preselection and preparation as those for towed guns. They are especially suited for use as roving guns or roving batteries.

The principles under which the opposing armor will operate are:

Generally, there are three methods of attack.

Armored attacks may be preceded by infantry, whose objective is the destruction of the hostile antitank weapons.

In situations that are unfavorable for infantry to attack ahead of armor, the tanks attack in the assault waves, followed by infantry. The mission of the tanks in this situation is to place the infantry on the objective with minimum losses.

The third method is to combine infantry and tanks in the assault waves.

The method to be used by the enemy cannot be determined in advance, therefore the antitank defense must be fabricated so as to meet all three of these conditions.

The guiding principle determining the number of destroyer battalions required is, *that sufficient tank destroyers must be massed to meet the enemy's armored capabilities.*

Tank destroyers reinforce and deepen the organic antitank defenses of the infantry division. The mission of the organic antitank defense is the local protection of the troops and installation. The mission of the attached antitank elements is the protection of the command or area as a whole.

There are two means of antitank defense, passive and active. They must be integrated closely in order to be effective.

Our role today is principally that of the attack, and our defense against hostile armor will be directed primarily towards stopping and destroying hostile tank counterattacks. In order that destroyers may be massed to meet hostile counterattacks, it is necessary to have adequate information as to the probable strength and direction of the enemy attack.

Since information regarding the hostile armored thrust will be available only after the enemy has committed himself, an adequate tank warning system must be provided.

The army or corps commander will indicate the general line or area of the barrier system. Mines and obstacles are then used to strengthen the natural barriers and canalize the attack. The intelligent use of dummy guns, faked detonations and flashes, roving guns, and other deceptive means, assist in directing the hostile tank approach into desired channels.

Usually, the infantry division is reinforced by one or more attached units, including tank destroyers. The defense calls for a cellular disposition of battalion areas. . . .

It should be stressed again that the primary mission of tank destroyer units is to *destroy enemy tanks by direct gun fire.* They are organized and equipped for that specific purpose. Secondary missions should not be undertaken at the expense of maximum proficiency in the execution of the primary mission, nor should training for secondary missions be undertaken until proficiency in the primary mission is attained. The performance of secondary missions is contingent upon three factors: training of personnel; battlefield maintenance and timely replacement of materiel; and tactical dispositions on the battlefield to meet all enemy armored capabilities. To be effective against enemy armor, an adequate tank warning net must be maintained. Continued vigorous reconnaissance by tank destroyer units must be insured, and sufficient tank destroyers must be massed at the proper place in sufficient depth and time to meet the enemy armored thrust.—From *The Cavalry Journal,* May-June, 1944.

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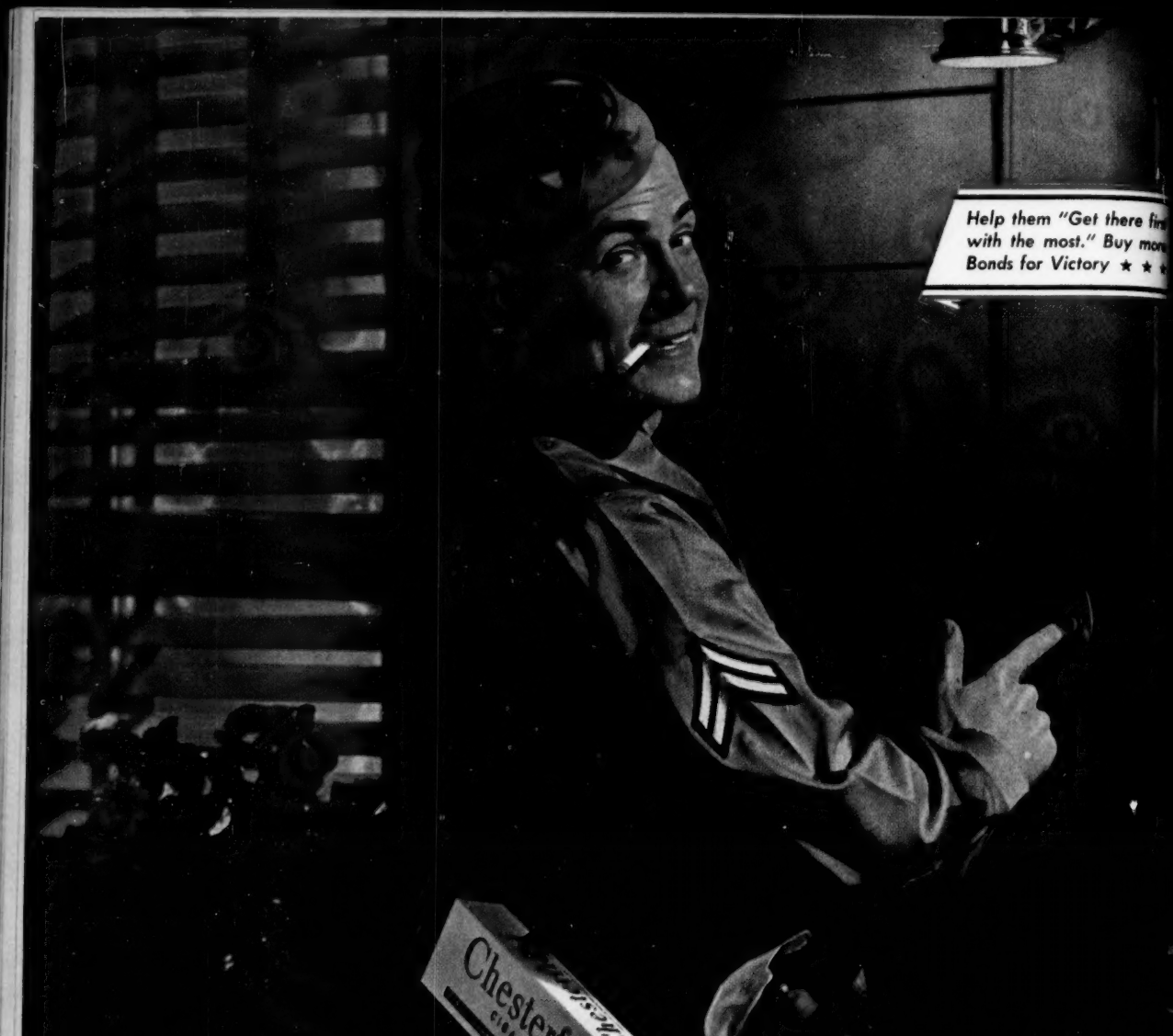

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